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REPORT ON THE PREVALENCE OF TYPHOID FEVER IN THE DISTRICT OF COLUMBIA.

BY GEORGE M. KOBER,

Special Medical Sanitary Inspector.

DECEMBER 2, 1895.

To the Honorable Commissioners of the District of Columbia:

GENTLEMEN: I have the honor to hand you herewith the report of Dr. George M. Kober, special medical sanitary inspector, upon his recent investigation of 500 cases of typhoid fever, selected at random from among those occurring in the District between July 1, 1895, and October 31, 1895, inclusive.

I must express my regret that the men and money at the disposal of this department are so limited that it is impossible to continue this investigation further, the emergency having passed which permitted the employment of a special inspector to be paid from the emergency fund. A health department falls short of its purpose which contents itself with the mere enforcement of the sanitary laws and the recording of vital statistics; it should continually keep watch over local conditions relating in any way to public health, and should investigate new methods in preventive medicine, so as to be able at all times to recommend, or even to adopt, proper measures to do away with unsanitary conditions, and so reduce to a minimum the cases of preventable diseases. It should not be compelled to wait until an emergency arises before the money becomes available even to begin an investigation into such matters. Yet such is the position of the health department of this District at the present time. I may add, therefore, to the recommedations contained in Dr. Kober's report another, viz:

That the health department be provided with means for conducting, at all times, inquiries similar to the present one, extending, however, not only to typhoid fever but to all preventable diseases.

In view of the sources of pollution of the Potomac River revealed by this investigation, and of the paramount importance of a proper water supply, I am of the opinion that, in addition to the construction of filter beds to remove impurities which can not be prevented from entering the river, steps should be taken to reduce to a minimum the amount of such impurities. I recommend, therefore—

That the Potomac basin be surveyed with especial reference to the present and prospective sources of contamination of our water supply and with a view to adopting whatever measures may be possible to remove and prevent the recurrence of such sources.

With these additions, and with the statement that improvement of the water supply is equally as important as the extension of the sewer system, and should take precedence over the extension of the sewer system, the recommendations of Dr. Kober are indorsed by me, and may be accepted as embodying the recommendations of the health department.

Respectfully, WM. C. WOODWARD, M. D.,
Health Officer.

NOVEMBER 27, 1895.

Wm. C. Woodward, M. D., Health Officer, District of Columbia, Washington, D. C.

SIR: In accordance with your instructions, and pursuant to an order from the Commissioners of the District of Columbia appointing me special medical sanitary inspector, I began my duties in the investigation of typhoid fever September 19, 1895.

NUMBER OF CASES OF TYPHOID FEVER.

As there is no law requiring compulsory notification to the health office of the cases of this disease existing, the only data indicating a greater prevalence thereof than usual were the certificates of death on file in your office, which, for the period beginning July 1, 1895, and ending September 18, 1895, amounted to 75, and as the average mortality from typhoid fever is rarely less than 10 per cent, these deaths were believed to represent from 600 to 750 cases during the period mentioned.

The next question naturally arose, Where are the cases, and what are the causes? The certificates of death furnished the address of all except the hospital cases. I visited these institutions and obtained not only the missing information but also the address of the patients who had been treated there since July 1, which afforded sufficient material to begin my labors. In order to render this inquiry as thorough as possible it was considered of the utmost importance to secure the cooperation of the medical profession, and hence the following circular was addressed to over 700 physicians in the District:

"SEPTEMBER 28, 1895.

"DEAR DOCTOR: In view of the large number of deaths from typhoid fever which have recently been reported to this department, your assistance is requested in making complete the investigation which is now being conducted to ascertain the causes for the prevalence of the disease and the proper measures to be adopted for its prevention. Will you kindly report on the inclosed cards such cases of typhoid fever as have occurred among your patients since July 1, 1895, or which may occur hereafter? Or, if preferred, will you kindly forward the necessary cards to families in which cases have occurred with a request that they make the report desired?

"Additional cards can be had upon application to this office, and penalty envelopes will be furnished for making the returns, if preferred.

"Respectfully, "WM. C. WOODWARD, M. D.,
"*Health Officer.*"

The circulars were accompanied by information cards, of which the following is a copy:

"*Typhoid Fever.*

"WASHINGTON, D. C., ———, 189—.

"*To the Health Officer, D. C.:*

"I respectfully report the following case of typhoid fever:

"Name, ———; sex, ———; age, ——— years; color, ———; location [street and number], ———; date of attack, ———; how many days absent from the city just prior to attack, ——— days; consumer of Potomac water [yes or no] ———; consumer of well water [yes or no] ———; location of well, ——— ———; name of milkman, ——— ———. Remarks, ———.

"Signature, ——— ———.
"Address, ——— ———.

"(An inspector from health department will investigate the case unless otherwise requested.)"

Replies were received from 7 hospitals and 135 physicians, reporting to October 31 428 cases. Fifty-one physicians, the majority of whom were either engaged in practice limited to special diseases or retired, replied that they had treated no cases of typhoid fever since July 1. The health office had on file 90 death certificates signed by

the physicians who reported the 428 cases, but as one physician on the list reported only 1 case of typhoid fever when he had signed three certificates of death from this disease, it became apparent that others were perhaps equally forgetful, and that the material was useless for statistical purposes. The members of the medical profession who systematically reported their cases deserve, however, great credit, as the reports aided me in locating the majority of the cases investigated; but I desire it to be distinctly understood that they afford no indication of the actual number of cases in the city for the four months ending October 31, 1895, and in estimating the number of cases I had to fall back upon a computation of the number of deaths reported to your office, which, for the four months ending October 31, amounted to 149. Of this number, 4 occurred in persons who had been brought to this city for hospital treatment, 1 in the person of a gentleman from Atlanta temporarily in the city, and in 1 the residence could not be determined by the authorities of Freedmen's Hospital, leaving a balance of 143 deaths to be accounted for. Assuming that each death represents 10 cases of typhoid fever, there would have been 1,430 cases. If we assume the mortality to have been 20 per cent, the number of cases would have been 715. Murchison places the death rate from this disease at 17.45 per cent, which is perhaps none too high for this city during the period mentioned, as seven of our hospitals treated during the four months 131 cases, with 23 deaths, or a mortality of 17.56 per cent.

In the United States Army, with a competent corps of medical officers, excellent hospital facilities, and patients in the prime of life to deal with, the mortality for the past five years in 674 cases of typhoid fever was 74, or 10.98 per cent. These data were kindly furnished by Surgeon Charles Smart, of the United States Army, from the official records of the Surgeon-General's Office. In view of all the circumstances, and especially because the majority of the deaths occurred during and after the heated term, when the power of resistance was at its lowest ebb, it is fair to assume that the average mortality was 18 per cent and that the 143 deaths represented 795 cases of typhoid fever.

It may be urged that a number of the fatal cases were not typhoid fever, but due to malarial or septic diseases. This objection must be met by the fact that for the purpose of offsetting errors in diagnosis I have excluded the 8 deaths from typhoid-malaria reported to your office, and which, strictly speaking, should be classed as typhoid fever. It is also possible that deaths reported from other causes were really due to typhoid fever, especially as, during the four months ending October 31, there were 46 deaths from malarial fevers, as compared with 27 deaths for the corresponding months of the preceding year.

TYPHOID FEVER HAS INCREASED WITH APPROXIMATE UNIFORMITY IN THE DISTRICT OF COLUMBIA DURING THE PAST TWELVE YEARS.

The number of estimated cases, or, if you please, the 143 deaths, point with more than mere suspicion to a very great prevalence of typhoid fever in the National Capital. A city or community may at times suffer from a sudden or explosive outbreak, affecting a large number of persons, generally due to a common cause, such as water or milk infection, but since the death rate has increased with approximate uniformity during the past twelve years the causes can not be ephemeral, but must be persistent and largely local. The material rise during the months of July, August, September, and October, as compared with corresponding months of preceding years, is perhaps largely due to meterological conditions, such as prolonged dry weather, low stage of water, and corresponding concentration of impurities, which will be referred to later.

NUMBER OF CASES INVESTIGATED, AND THEIR DISTRIBUTION IN DIFFERENT PARTS OF THE DISTRICT.

It was deemed desirable to investigate at least 500 cases distributed over different parts of the city, with the hope that the information gained by a personal inspection of the premises and surroundings, condition of the house drains, methods for the collection of fecal matter, together with the results of the inquiry into the water and milk supply, and the antecedents of the cases, whether absent from the city, and the general health of the patient prior to the attack, would furnish valuable data concerning the causation and persistence of the disease.

The 500 cases examined by me were distributed as follows:

Distribution of Cases Examined.

Locality.	Contracted in the District.		Contracted at summer resorts.	
	Cases recovered.	Fatal cases.	Cases recovered.	Fatal cases.
Reno, Tenleytown, Chevy Chase and vicinity	10	3	1	0
Washington Heights, Columbia Heights, Meridian Hill, Mount Pleasant, Le Droit Park	14	2	1	1
Brightwood and Takoma	18	5	0	0
Brookland	11	0	0	0
Ivy City and Bladensburg Road	13	6	0	0
Gales and Seaton street NE	15	3	0	1
Anacostia	9	6	1	2
Northeast	65	24	5	0
Southeast and Southwest	48	30	18	1
Central, from North Capitol to Thirteenth street	71	21	9	3
Northwest, Thirteenth to Rock Creek	34	9	13	3
Georgetown	13	6	2	3
Total	321	115	50	14

From the foregoing table it appears that of the 500 cases 436 contracted the disease at home and 64, or 12.4 per cent, outside of the District limits. Of these 64 cases I need only say that 63 had been consumers of well or spring water at various summer resorts, 17 of the number having sojourned at Colonial Beach. This fact simply tends to confirm the opinion that the autumnal rise of typhoid fever in cities is to a certain extent influenced by the return from the country of persons who have contracted the germs of the disease in the rural districts; indeed, not a few are actually taken sick there and hasten to their home for medical treatment. For the purpose of studying the relative frequency of the disease according to population in different parts of the District, I have divided the entire county into six sanitary districts.

The first district comprising all that part of the city south of East Capitol street and the public grounds, including the southeast and southwest part of the city, as far as the banks of the Potomac and the Eastern Branch, with a population of 65,328, furnished 78 of the 436 cases contracted at home, or 11.94 cases per 10,000 of inhabitants.

District 2, east of North Capitol and north of East Capitol streets, with a population of 27,417, furnished 89 cases, or 32.46 cases per 10,000 of inhabitants.

District 3 (central), comprising all that part of the city west of North Capitol, east of Thirteenth street, and north of public grounds, with a population of 74,408, furnished 92 cases, or 12.36 cases per 10,000 of inhabitants.

District 4, west of Thirteenth street, east of Rock Creek, and north of the river to Florida avenue, with a population of 52,407, furnished 43 cases, or 8.11 cases per 10,000 of inhabitants.

District 5, or what is commonly known as Georgetown, with a population of 17,045, contributed 19 cases, or 11.15 cases per 10,000 of inhabitants.

District No. 6, comprising all other portions of the county not already accounted for, including our suburbs, with a population of 31,950, furnished 115 cases, or 36 cases per 10,000 of inhabitants.

TABLE I.—*Statement showing the distribution of 436 cases of typhoid fever contracted in the District of Columbia, with rate per 10,000 of population in each section.*

Sections.	Estimated population by section, 1895.	Cases of typhoid fever contracted in the District.	Ratio of cases of typhoid fever to each 10,000 of population in each region.
I. South	65,328	78	11.94
II. Northeast	27,417	89	32.46
III. Central	74,408	92	12.36
IV. Northwest	52,467	43	8.11
V. Georgetown	17,045	19	11.15
VI. County	31,950	115	36.00

DISTRIBUTION OF THE FATAL CASES.

In the location of cases I have been largely guided by the cases reported to the office, but as physicians residing in some sections may have been more faithful than others in

reporting their cases, there would be a chance for incorrect deductions, and to eliminate a possible source of error it is necessary that we study the distribution of the fatal cases in the same manner.

Of the 143 deaths among residents of the District of Columbia, 14 occurred in persons who had contracted the disease at summer resorts, leaving a balance of 129 deaths to be accounted for, and these deaths were distributed as follows:

TABLE II.—*Statement showing the distribution of deaths from typhoid fever contracted in the District of Columbia during June, July, August, September, and October, 1895, with rate per 10,000 inhabitants in each section.*

Sections.	Estimated population by section, 1895.	Cases of typhoid fever contracted in the District.	Ratio of cases of typhoid fever to each 10,000 of population in each region.
I. South	65,328	34	5.20
II. Northeast	27,417	24	8.76
III. Central	74,408	29	4.00
IV. Northwest	52,467	9	1.71
V. Georgetown	17,045	6	3.53
VI. County	31,950	27	8.44
		129	

Whether we take the number of cases examined by me, or the number of deaths reported to the office as a basis to determine the relative frequency of typhoid fever in different parts of the city, the same significant fact developes that the disease is more prevalent in the suburbs and in the northeast in proportion to the population than in any other part of the city.

A study of this table furnishes ample food for reflection, and the question naturally arises how to account for this difference.

Before attempting to furnish an answer, it is desirable to recall the various factors which are believed to be concerned in

THE CAUSATION AND SPREAD OF TYPHOID FEVER.

The majority of physicians hold that the disease is caused by a living germ, belonging to the lowest form of vegetable life and known as the bacillus of Eberth. This microbe has been constantly found in the intestinal discharges, and almost always in the blood and urine of typhoid fever patients, and in the mesenteric glands, spleen, and other organs of persons dead from the disease. It has been isolated and cultivated in suitable media outside of the body, but a pure culture thus obtained when introduced into the body of a healthy animal has not produced the disease in question. Absolute proof is therefore wanting.

It has been shown that these organisms can be cultivated in gelatine, agar-agar, potato slices, also in milk, meat broths, and bread crusts; that they can retain their vitality for a certain length of time in ordinary water, and may even proliferate in certain quantities of water, and that their longevity is materially influenced by the presence of organic nitrogen in the water. Professor Jordan, of Chicago, has recently shown that so small an increment as 0.0126 organic nitrogen (parts per 100,000) causes a perceptible lengthening of the life of the typhoid bacilli. Prudden has shown that they can retain their vitality in ice for 103 days. Grancher has demonstrated that they can develop in soil, and Uffelman's experiments show that they retain their vitality for a year at least in decomposing fecal matter.

The studies of Rodet and Roux appear to indicate that the bacillus of Eberth is nothing more than a modification of the colon bacillus, a constant inhabitant of the intestinal canal of man and other animals, which may acquire morbific properties outside of the body, and this has opened the question whether the bacteria may be benign in one locality and malignant in another. There are not a few who are disposed to believe that the virulence of disease germs depends largely upon the character of their food and environments, and that soil-pollution and other unsanitary surroundings offer suitable conditions for the transformation of harmless into morbific germs outside of the body.

There is nothing strained in this assumption, because we know that climatic conditions and the character of the soil influence the quality of the larger plants and fruits, and why not the lowest forms of vegetable life? All scientific physicians agree, however, upon one point, viz, that typhoid fever is caused by an organized germ

capable of reproducing itself within and without the body, instead of such hypothetical matter as miasms or contagia, whose nature has never been demonstrated to our senses. On no other theory, except the germ theory, can we explain the occurrence of typhoid fever epidemics spread through the water and milk supply. If we reject the germ theory, we will indeed be forced to the conclusion that fecal and putrescible matter when present in milk or water in infinitesimal dilutions is capable of producing the disease in question. "A poison may produce sickness and even cause death, but it can not infect, because it can not reproduce itself."

According to the advocates of the germ theory, a certain number of typhoid bacilli gain admission, we will say, into the intestinal tract, and, if the conditions are favorable, begin to proliferate. It has been estimated that a single germ by growth and subdivision is capable of producing over sixteen millions of similar germs in twenty-four hours. In consequence of their own life's process they produce a soluble poison which, when absorbed, gives rise to constitutional symptoms, and in addition also acts as a local irritant and causes the lesions in the alimentary canal, characterized usually in the first week by infiltration, in the second week by ulceration, and in the third week by separation of the sloughs.

The intensity of the local and general symptoms doubtless depends not only upon the dose of the fever-producing agent, but also upon the individual susceptibility, or rather the aptitude, of the organism to feel the effects of the poison evolved by the germs. In this way we get our mild, medium, severe, or irregular types of enteric fever, differing simply in degree but not in kind.

A mild infection may give rise to abdominal catarrh, with symptoms of catarrhal jaundice, and temperature not exceeding 100°. Many of such cases have been observed, in which there was enlargement of the spleen, with the characteristic eruption.

Again, there are cases, though quite infrequent in the United States, which have been described as the abortive form, in which somewhere between the seventh and fourteenth day, as Jaccoud expresses it, "the sickness takes a sudden turn and runs a course similar, as regards enteric fever, to that which varioloid runs as regards variola." Griesinger reports a case where the duration did not exceed five days.

Such cases can only be explained by assuming that the intestinal lesions undergo resolution, and that we simply have to deal with the primary fever and not with the secondary or septic fever due to the ulcerations and formation of sloughs.

CHANNELS OF INVASION AND MODES OF DISSEMINATION.

The invasion of the microbe most likely takes place through the alimentary tract, as evidenced by the primary intestinal lesion and the frequent dissemination of the disease through the water and milk supply. The possibility of transmission of the virus through the air should not be excluded, for, as in tuberculosis so in this disease, the infectious material may have become dried and pulverized and with particles of dust gain access to food or into the mouth, there to be swallowed or inhaled.

The principal source of transmission of the microbe, however, is through the water supply, infected milk and food, and there is much reason for believing that in such cases the virus proceeded from the dejecta of typhoid patients which gained access to the water supply directly or through the soil, or the wash water from patients and infected clothing and bedding, or found its way into vegetables and fruits, which are eaten raw, through the medium of fertilizers or washing them in infected water.

The agency of flies and other insects in carrying the germs from box privies and other receptacles for typhoid stools to the food supply can not be ignored.

MILK INFECTIONS.

Dr. Busey and myself have tabulated 130 epidemics of typhoid fever from all parts of the world, which were traced to contaminated milk.

In 109 instances there is evidence of the disease having prevailed at the farm or dairy.

In 54 the poison reached the milk by soakage of the germs into the well water with which the utensils were washed; in 14 of these the intentional dilution with polluted water is admitted.

In 6 instances the infection is attributed to the cows wading in sewage-polluted water. In 3 instances the infection was spread in ice cream prepared in infected premises. In 21 instances the dairy employees also acted as nurses. In 6 instances the patients while suffering from a mild attack of enteric fever or during the first week or ten days of their illness continued at work, and those who are familiar with the personal habits of the average dairy boy will have no difficulty in surmising the manner of direct digital infection. In one instance the milk tins were washed with the same dish cloth used among the fever patients.

WATER-BORNE EPIDEMICS.

I will not weary you with the recital of numerous instances in which the disease has been spread by polluted drinking water.

We have the experience of Plymouth to show that the excreta of a single typhoid patient washed into a stream caused over 1,000 cases of this fever. A study of the epidemic at Cumberland, Md., 1889-'90, indicates that typhoid fever was not present until the discharges from a case living on one of the little runs which empties into the Potomac about 200 feet above the pumping station found their way into the city water supply. Such instances could be recited by the hundreds.

INFECTED SELTZER WATER.

Helwig reports an outbreak at Mayence in 1884, which was traced to the use of artificial seltzer water, the water having been obtained from a well polluted with typhoid dejecta.

INFECTED WELLS.

Breumer presents the medical history of a farm, showing for twenty-four years the occurrence of typhoid fever, sometimes amounting to an epidemic. During a similar outbreak in 1886 he examined the drinking water, which, though clear and odorless, contained 20,000 germs per teaspoonful, among others fecal or intestinal bacteria.

Such instances are by no means infrequent, and this report will deal with a large number of infected wells in our own city.

An outbreak of typhoid fever at Hirschfelden in 1885 was limited to persons using the water from a well, in the vicinity of which the mother of a typhoid patient had been washing the soiled linen and bedding of her son.

INFECTED CLOTHING.

Gelau reports an epidemic which renders it probable that the disease may be communicated by means of infected clothing. A German army regiment, with an average mean strength of 353 men, between the years of 1873 and 1884, furnished not less than 146 cases of typhoid fever. The water supply was above suspicion, and disinfection of the quarters and even abandonment of the barracks failed to check the disease. This finally led to the suspicion that the clothing might be the source of infection, especially as the garments were promiscuously worn. Examination revealed the presence of fecal spots in a number of pantaloons. The clothing was now disinfected, after which only 3 mild cases appeared, and these were confined to the men engaged in the disinfection.

INFECTED HANDS.

There are of course a number of instances on record in which the disease was contracted by washerwomen, nurses, and persons engaged in the removal of night soil containing typhoid stools, and the most probable explanation is, that in the majority of these cases the virus was conveyed to the mouth by means of infected fingers.

Professor Finkler, of Bonn, a very competent observer, believes that the disease may be communicated by intimate contact, living in the same room, or breathing the same air, and accounts in this way for a number of outbreaks in his section. In 1886 a woman who had been called to one hamlet to nurse her children returned to her home, was taken sick with typhoid fever and communicated the disease to her nurse, and subsequently fifty other cases developed which could not be traced to soil pollution or infected water supply. From this locality 3 children were admitted to the hospital at Bonn; here 4 persons were attacked who had come in direct contact, and 5 washerwomen who had come into indirect contact, i. e., through the clothing and linen of the patients. I have found similar instances in my present investigation, but it is practically impossible to say whether in these cases the germs were conveyed through the fingers or through the air, or by means of flies infecting the food. Pfuhl, a German military surgeon, has recorded an observation which renders it probable that typhoid fever may be contracted by bathing in polluted streams.

INFECTED SEWER AIR, ETC.

It is not impossible that the inhalation of putrid gases emanating from infected sewage may cause typhoid fever. At all events, Heuber reports an outbreak in the barracks of Ulm, traced to the noxious exhalations of privy vaults. Swete attributed

an extensive epidemic at Kidderminster to the inhalation of sewer air, and the late Sir George Buchanan described an epidemic at Croydon, in 1875, due to the entrance of air from unventilated sewer pipes into the houses of those attacked, and I have seen instances in this city where defective house plumbing and the occurrence of typhoid fever cases were coincident. There are not a few who assert that the danger from sewer air has been overrated, and adduce experiments upon lower animals tending to show that they can breathe such air for days or weeks with impunity, but rats, mice, and guinea pigs may flourish in an air where man would find it difficult to exist, and there is as much reason for assuming that the germs of typhoid fever, when present in stagnant sewers or in the soil, may be liberated and infect the air as there is for believing that the germs of malaria are carried from the soil by the ascending currents of the air.

Such instances are too numerous to be simply ignored, and certainly justify the inference that sometimes the expired breath of typhoid patients and emanations from sewers, cesspools, and polluted soils may serve as channels for the transmission of the germ.

SEASONAL DISTRIBUTION OF TYPHOID FEVER.

Typhoid fever is most prevalent and gives the largest mortality in the late autumn months. In England the disease begins to increase in August and attains its maximum late in October, from which point it gradually falls. If temperature and moisture of the soil have any connection with the rise and fall of enteric fever, we can readily understand that the season of its greatest prevalence varies in different localities. In this district the disease generally begins to increase in May, and gradually but steadily attains its maximum in October. Numerous observations indicate that hot, dry summers tend to aggravate the intensity of the autumnal rise, and as this is quite general it would appear that a high temperature favors the proper development of the virus in stagnant sewer deposits or polluted subsoils. But apart from this, and perhaps more essential, is the fact that a dry summer plays an important role in the rise and fall of the ground water. Pettenkoffer and his school believe that the virus originates and develops in the soil and is carried into the air by emanations, and that a fall of the ground water is followed by an increase and a rise of the subsoil water by a decrease in the number of cases. The opponents of this theory hold that the germs of the disease in consequence of soil pollution are there, but may remain innocuous as long as they are submerged in water; that with the recession of the ground water the warm air of July and August enters the deeper layers of the soil and stimulates the organisms into activity; that the soil is therefore a medium for their propogation and transfer into the water supply. The rise and fall of the ground water is believed to play a role only in so far as it affects the heat, air, and moisture essential for their growth, and that a fall of the subsoil water would naturally favor their transport into wells. When the stage of the water is low the wells also drain a larger area. This means increased chances for contamination, and if the germs are already present it certainly means concentration of impurities and larger doses of the fever producing poison.

PREDISPOSITION.

In addition to the germ, there must also be a suitable soil for its proliferation in the system, and this individual predisposition or vulnerability which renders the body more liable to be acted upon by the germs may be the result of debility, faulty nutrition, fatigue, excesses of all kinds, abrupt changes of temperature, impure air, mental depression, unwholesome food, and many other factors calculated to diminish the power of resistance in the individual. But, after all, there is a vulnerability which has not been satisfactorily explained, for many persons fall victims to the disease who are apparently healthy and robust at the time of the seizure, and in whom perhaps the contents of the alimentary tract offer a suitable medium for the proliferation of the germs.

Having thus sketched the causes and modes of dissemination as generally accepted by the profession, let us see in how far they are applicable to our own city and county, beginning with a consideration of the

CAUSES OF TYPHOID FEVER IN THE SUBURBS.

I have examined in the suburbs 122 cases, 7 of which were contracted at summer resorts, leaving 115 cases to be accounted for.

Tenleytown, Wesley Heights, Reno, Chevy Chase, etc.—Most of the 13 cases investigated by me in this section were found in the homes of the poorer classes, where wells

and privies have been dangerous neighbors for years, and although the law compels the use of properly constructed box privies, I have still encountered the most primitive forms of outhouses. In one instance there was not even a pit, but the ordure was deposited upon the surface, about 40 yards from their well, in a spot favorable for percolation. The family occupied one of the most commanding heights at Reno, and are evidently only tenants of what promises to be valuable real estate. The soil is very porous, and the surface drainage is excellent. Upon inquiry as to what disposition had been made of the stools of the patient, the mother pointed out a spot where they had been buried with the best intention, of course, to render them innocuous, but perhaps only to contaminate a spring distant about 200 yards, and we will never know how many people who partake of this spring will be infected when sufficient time for percolation shall have taken place. The pernicious habit of burying the discharges from typhoid fever patients without previous disinfection, under the impression that it is the best method of preventing contagion, is very widespread, and by no means confined to the ignorant classes. If they had been properly disinfected no harm could result, but as it is germs are there, soil pollution has taken place, and this means sooner or later water pollution.

In another instance a family residing in a depression near Loughboro Road had 3 cases between July 11 and August 13. The milk supply was above suspicion, but all had consumed water from a well which was liable to pollution from a surface privy. This outhouse is located upon a slope with drainage in the direction of a small stream, which in turn may contaminate some distant spring or well. The family, having passed through the sickness, might reside there for years without perhaps another case, but, considering "the house unhealthy," they have removed, and thus made room for other tenants to be attacked.

In another family with 2 cases of typhoid fever the water was obtained from a well located within 24 feet from a leaky box privy, with most unsanitary surroundings in the yard and abundant evidence of soil pollution. In another instance the well was located only 18 feet from a leaky box privy. The patient, a young colored woman, was brought to the city for treatment, and died at Snow's Row in the northwest.

Of these 13 cases, 10 were exclusive consumers of well water, and 3 used both Potomac and pump water.

The 13 houses were supplied as follows: Box privies in good condition, 8; box privies in leaky condition, 3; surface privies, 2. Three fatal cases, white, 2; colored, 1.

Washington Heights, Columbia Heights, Mount Pleasant, Le Droit Park.—Of the 18 cases examined by me in that section, 16 were contracted at home and 2 at summer resorts.

Many of the houses have sewer connections, and are no longer suburban in that respect, but as they are outside of the boundary limits, and are undergoing a transition stage from suburban to city homes, they have been included here. The occurrence of several cases of typhoid fever in Nos. 1403, 1405 and 1407 Howard avenue is of special interest. These houses, with three others in the same block, had no sewer connections prior to October, 1894, and all the house drainage was carried by pipes to a cesspool in the rear of premises No. 1405. Typhoid fever prevailed among the inmates of house No. 1413, with a fatal case during the year ending June 30, 1894. The dejecta were presumably thrown in the closet and reached the cesspool, which in the fall of 1894 was covered up with earth. In July of the present year, a case of typhoid fever developed in house No. 1403, another case, residing in 1405, developed shortly after the arrival of the family at Ogdensburg, N. Y., 2 cases developed in house No. 1407, and a case of remittent fever of 5 weeks' duration in house No. 1409.

There is no evidence to connect these cases with contaminated wells or the milk supply, and the occurrence of typhoid fever in the same block of houses during last year and of the cases in adjoining houses nearest the infected cesspool this year, points to the latter as a probable source of infection, and we are obliged to assume that, with the recession of the ground water, the air penetrated the deeper layers of the soil, and that the germs were carried up by the ascending currents of the ground air either directly into the air or to the surface of the soil from whence they were liberated, and with pulverized dust gained access to the system; of course we have no definite proof of such an occurrence, however probable I might think it to be.

The case on Messmore avenue occurred in a house with very unsanitary surroundings, since all of the houses in that square bounded by Huron and Erie streets are still supplied with box privies and surface drainage, both creating intolerable nuisances during the heated term.

The 3 cases on Sheridan avenue occurred in houses supplied with box privies and wells in the yard. A case occurring on G street in the extreme northwest was also traced to one of these wells. A fatal case, a consumer of this particular water, was characterized by Dr. Forwood, U. S. A., as very malignant from the onset, still the bacteriological examination of the water proved negative.

Of the 16 cases, 7 were consumers of well water, 7 were consumers of Potomac water, 2 of cistern water. Three of the consumers of well water also drank Potomac water.

Water-closet in house, 8; water-closet in yard, 4; box privy in yard, 4. (Two fatal cases, both white.)

Brightwood Avenue and Takoma Park.—I have examined 23 cases in these suburbs, 18 of which occurred at Takoma Park. This suburb is delightfully situated on elevated ground, with excellent surface drainage and a dry, porous soil, affording splendid building sites for healthful homes, provided soil pollution had been prevented, but, as elsewhere, so here we find that privy sinks and wells have been dangerous neighbors, and as many of the cesspools were mere excavations or holes in the ground, receiving not only fecal matter but also drainage from the house, we need not be assured that they were preferred to the present box privies because "they never needed cleaning." I understand that up to 1893 these cesspools were in common use, and according to the graphic report of Mr. O. T. Beaumont, sanitary inspector, some are still in existence. This, together with a custom quite common even now of burying the contents of the box privies upon the premises, has doubtless resulted in a gross form of soil pollution and converted otherwise healthful building sites into veritable hotbeds for disease germs, and all that was needed was the introduction of the specific germs from a case of typhoid fever. All this is to be regretted, because the guilty parties frequently escape, while families willing and anxious to obey the ordinary laws of cleanliness suffer from the misdeeds of their neighbors. This is rendered painfully apparent by the medical history of a family who resided at Maple avenue, in southeastern Takoma, for eight years, enjoying good health until August, 1894, when the first case of typhoid fever developed.

In July of the present year a son was taken sick, and since then 7 other members of the family; one of these, hoping to escape, went to Massachusetts and was taken sick shortly after her arrival. In the meantime, 3 other cases occurred in a family residing in a different part of Takoma who had drank water from the well and received their milk supply from this house, and still another case developed in a gentleman who received his milk supply there, but even in this case it was fair to assume that the germs were conveyed by washing the utensils and milk pans with the infected well water. I made an inspection September 22, and from the topography and nature of the soil it was at once apparent that the premises and well, occupying a rather low ground, received the drainage from several blocks of houses. The next step was to discover the source of a specific contamination of this well. From the cleanly habits of this family and the statement of the physician in charge it appeared highly improbable that the case from last year was the source of infection, as the dejecta had been properly disinfected and disposed of; but two possible other sources were discovered, viz: In the summer of 1893 typhoid fever prevailed in the premises on lot No. 4, indicated on plat, also 2 cases on lot No. 1. Both houses were supplied with wells, the trend of the land from lot 4 being toward lot 1, and the drainage from the latter is decidedly in the direction of the well in question. These premises, prior to 1893, had privy sinks or cesspools; now they are supplied with box privies, but lot 1 also has a water-closet in the house, and the contents, with other drainage, is discharged into the soil about 300 feet west of the well of this unfortunate family. The house on lot 1 had a mild case of tyhoid fever in July of the present year, and, although it is claimed that the water-closet is not used, I found it to be in working order when I emptied the flushing tank.

As a second source I found a 24-inch sewer which discharges upon the surface into a depression directly in rear of premises southeast corner of Maple and Carroll avenues and about 700 feet north of the well referred to; after rains the contents of this sewer are of course washed farther down. This sewer carries the drainage from several houses indicated on the plat. One of these houses had a case of typhoid fever in 1894, shortly before the case in the house under consideration. The general facts warranted the conclusion that the well had been exposed to contamination both from the north and west sources described. In any event, I considered this well infected, and confidently expected that a bacteriological examination would demonstrate the presence of the specific germs, and so expressed myself to Dr. J. J. Kinyoun, of the Marine Hospital Bureau, who conducted the examination. You can readily imagine my surprise when this accomplished bacteriologist informed me that the water presented for examination September 22 was free from suspicious bacteria, and since that time he has examined 3 more samples at different intervals with the same negative result. I felt a source of bitter disappointment that a method of reasoning, based upon observed facts, could not be confirmed by bacteriological proof. Fortunately for science, the family had sent a specimen of the water five days before to the Army Medical Museum, and in that specimen fecal bacteria were found, as shown by the following letter:

"WAR DEPARTMENT, SURGEON-GENERAL'S OFFICE,
"U. S. ARMY MEDICAL MUSEUM AND LIBRARY,
"*Washington, D. C., September 26, 1895.*

"Dr. WM. C. WOODWARD,
"*Health Officer, District of Columbia, Washington, D. C.*

"DEAR DOCTOR: The sample of well water left at this laboratory on September 17 by Mr. L., of Takoma Park, and said to have come from the well of Mrs. P., of Maple avenue, Takoma Park, has been examined bacteriologically and found to contain colonies of the bacillus coli communis.

"Very respectfully,
WALTER REED,
"*Surgeon, U. S. Army, Curator.*"

I will simply add that, although Dr. Reed examined additional specimens of this water later, that he had not found the colon bacillus, except in the sample taken September 17, thus not only confirming the correctness of their independent labors, but also the interesting fact, long suspected by sanitarians, but never so completely demonstrated, that a well may be infected at one time and all evidence disappear a week, a few days, or a few hours later.

The results of the second examination made by Dr. Reed are shown in a letter dated October 28, and addressed to Dr. Chas. G. Stone, of Brightwood, D. C.:

"About three weeks ago I sent a messenger, as requested by you, to procure water from Mrs. P.'s well at Takoma Park. The water was received in two sterilized flasks and brought at once to the laboratory, where it was not only promptly plated, but ten different specimens of the water were subjected to Parietti's test for the typhoid organism. Since that time we have carefully followed out the identification of all colonies appearing, and I am compelled to report to you that this examination not only does not show the presence of any typhoid bacilli, but we have not perceived any colonies of colon bacilli."

Two other cases occurred in boarders of a family who used water for household purposes from a well located about 100 feet from the outlet of the 24-inch sewer. One was taken sick July 10, treated at Sibley Hospital, where he died, while his daughter, who had gone to New Hampshire, was taken sick there about the same time, and also died, August 1.

Two cases occurred among consumers of a contaminated spring, located in a depression between Spring, Oak, Chestnut, and the Baltimore and Ohio Railroad, and the mother of one of these patients contracted the disease while nursing her son.

Of the 23 cases, all white, at Brightwood Avenue and Takoma Park there were 6 deaths. All have been consumers of well water; 8 had drank both well and Potomac water; 11 were traced to the well repeatedly referred to.

Box privies, 20; water-closets in yard, 3.

Brookland.—I have examined 11 cases at this suburb; all but 2 of these could be traced directly to infected wells; one of these was located in a depression near the University station and the other on the side hill of private premises on Bunker Hill road, between Seventh and Eighth streets. A case of typhoid fever occurred on Lowell street, between Seventh and Eighth streets, June 18, 1895. The father, hoping to prevent contagion, buried the dejecta, the slope and character of the soil favoring percolation toward the wells in question. The next cases occurred in consumers of water from these wells July 15, 18, 20, 25, August 1 and 2, and a secondary case in one of the houses September 1.

Two other cases occurred in one of the seminaries among consumers of Potomac water; none of the 11 cases proved fatal.

Consumers of well water, 9; consumers of Potomac water, 2; box privies, 9; water-closets connected with cesspools, 2.

As the evidence pointed strongly to the contamination of the wells, I recommended their temporary closing, and the result of the bacteriological examination proved the wisdom of this precaution. I also recommended a house to house inspection to determine the number of cesspools, the disposal of refuse, the condition of privy boxes and stables and their relation to wells. The fact that quite a number of houses were supplied with water-closets and house drains whose contents were discharged upon the surface, together with reckless disposal of garbage and slops, impressed me as formidable causes for soil pollution in a locality which, like Takoma Park, was favored with very porous soil.

The result of this inspection will be seen by reference to the report of Sanitary Inspector O. T. Beaumont.

Ivy City and Bladensburg Road.—I have examined 11 cases at Ivy City and 8 on Bladensburg road. In the former suburb there are no sewer connections. The cases

occurred in 8 different houses; 7 were supplied with box privies, 4 of which were found in a leaky condition, and 1 house had no privy in any shape, the dejecta having been thrown upon a vacant lot in rear of the premises.

Five of the patients had drank water from Bennett's well, 3 from Cleveland's well, 2 from an underground cistern, and 1 from a surface spring. The cistern, as also Cleveland's and Bennett's wells, were liable to contamination from leaky box privies, and fecal bacteria were demonstrated in the cistern water and some of the wells (see Dr. J. J. Kinyoun's report.)

Three fatal cases, white, 1; colored, 2.

All of the cases on Bladensburg road and vicinity, except those on Lewis street, occurred in houses supplied with box privies. It was admitted that the stools from typhoid patients residing on Bladensburg road were thrown upon the ground without disinfection, and as the drainage from these houses is in the direction of Trinidad avenue and King street the residents there were exposed to infection. There is abundant evidence of unlawful surface pollution, and stagnant kitchen slops may be observed on Trinidad avenue in a number of places, and as the germs find a suitable soil in such surroundings, it is possible that the flies, which abound wherever surface pollution exists, may carry the germs into the houses and contaminate the food or drink. The first cases occurred on Bladensburg road on July 2. A little girl from S street NW. visited one of the infected premises on Bladensburg road, remained several weeks and was taken sick there. There was nothing in common in the milk supply of the different houses, and as there was no well liable to contamination from the first source, it is not improbable that the infection was conveyed in the manner indicated.

All of the 8 persons were consumers of Potomac water; 4 had taken both well and Potomac water.

Three fatal cases, white, 2; colored, 1.

Seaton, Gales, Nineteenth, and Twentieth Streets NE.—Reference to Map I will reveal quite a group of cases in this section; not less than 18 cases were contracted there, 3 of whom resided in other parts of the city but received their milk from this locality.

Two sources for this unusual prevalence of typhoid fever were discovered and it is difficult to say which of the two has contributed the largest quota of cases. Typhoid fever has prevailed in this locality in previous years. The first case this year occurred at 2007 Gales street, almost directly north of a pump located at 2020 Seaton street, which supplies the water to nearly all the houses on Gales and Seaton between Twentieth and Twenty-first streets. At least 11 of the cases were exclusive consumers of water from this well. The houses are all supplied with box privies, many of which were found in a leaky and unsanitary condition. Three families admitted that they had buried the dejecta on the commons in rear of their premises, and I regret to say that in one instance this was recommended as a preventive measure by the attending physician.

As the bacteriological examination of the water revealed the presence of fecal bacteria, contamination from this source may be fairly assumed.

One case occurred at 710 Twentieth street NE., where I found an overflowing barrel instead of a privy within 20 feet of the well. Bacteriological examination of this water by Dr. Kinyoun also revealed the presence of intestinal bacteria. Other cases on Nineteenth street received water or milk from infected premises.

Another, and perhaps equally fruitful, source of infection is the fact that many of the residents keep milch cows, which are permitted to roam at large over the commons and graze along the banks of a sluggish stream which receives the contents of the large Boundary sewer. I have seen a herd of 14 milch cows wading in this polluted stream, and it is perfectly conceivable that the germs of typhoid fever, if present in sewage, may adhere to the teats and udder of the cow and thus contaminate the milk supply. Several cases in the city, one in the central portion, were traced to milk from this infected locality. The proximity of the houses to the open sewer and the low and marshy character of the ground may have acted as predisposing factors, as many of the victims have been suffering from malarial infection, but the various sources combined, I believe, fully explain the unusual prevalence of typhoid fever in this circumscribed locality.

All the cases referred to were consumers of well water, 6 only having drank both Potomac and well water. All the houses were supplied with box privies, none having sewer connections.

Three fatal cases, all white.

Anacostia.—I have examined 18 cases in that section, 3 of which were contracted elsewhere; the 15 cases were distributed over different localities, such as Hillsdale, Congress Heights, Morris Road, and Anacostia proper; many of the cases were a mile apart and no two cases could be traced to a common cause, but the old story of contaminated wells and soil pollution must be invoked to explain the occurrence of the majority of the cases.

The cases occurred in houses supplied as follows: Water closets in yard, 2; box privies, 10; surface privies, 3.

Thirteen were consumers of well water, 2 were exclusive consumers of Potomac water. A case at No. 10 Minnesota avenue is of interest; the family occupies one of a number of frame houses, all depending for their water supply upon a well in rear of No. 9. This well, in my judgment, is liable not only to gross surface pollution, but also to specific infection from the case of typhoid fever, as the mother of the patient pointed out a spot not over thirty feet from the well where she had buried the dejecta. The biological examination of the water proved nothing. I have cautioned the people not to drink the water without boiling it, but the proper remedy would be to close the well before other cases are developed. There are doubtless a large number of unlawful privies in Anacostia. I found such a pit upon the premises of a respectable family occupying a rather elegant house, and the owner informed me that the rats consumed the ordure, as he had watched them in their unsavory occupation, forgetting, however, that these same rats make burrows and are thus liable to poison not only his own but also his neighbor's well.

Summary.

If we group all the cases in the suburbs, we find that the 115 cases occurred in 110 houses, supplied with methods for the disposal of the excreta as follows: Water-closets in yard or house, 18; water-closet connected with cesspool, 2; box privies, 86; surface privies, 3; no privy, 1.

Of the 115 cases, 92 were consumers of well water; 18 were consumers of Potomac water; 4 were consumers of cistern water; 1 was consumer of spring water. Twenty-five consumers of well water had also taken Potomac or spring water.

I have purposely devoted much space to presentation of the facts as observed in the suburbs, because what is true of them now was, under like circumstances, true of other parts of the city. Before the existence of sewers in the District, there were box privies, many of which are still in use, even when leaky or full to overflowing, and before the era of box-privies there were sinks and cesspools, and, therefore, ample opportunities for soil pollution to have taken place.

Under such circumstances we need not be surprised to find in the majority of well waters an excess of the chlorides which, unless due to marine deposits, are the invariable accompaniment of animal pollution.

Sufficient evidence has been adduced to show how the germs of typhoid fever may be conveyed from the intestinal tract to the soil, and from the soil back to the system chiefly through the water supply, not excluding, however, the rarer instances of transmission alluded to. Soil pollution and contaminated water, however, must be regarded as the most potent factors to account for the relative frequency of this disease in the suburbs.

CAUSES OF TYPHOID FEVER IN THE NORTHEAST.

I have examined 94 cases in the northeast section, of which 5 cases were contracted at summer resorts. Some of the cases are grouped in certain squares, suggesting either the existence of local causes or the possibility that they had followed the routes of certain milkmen. The latter explanation must be excluded, as there was nothing in common in the milk supply in the majority of cases. In my investigation the fact soon developed that there was a decided incident between typhoid fever and the consumers of water from certain wells, and the malignancy of the cases appeared to depend upon the amount of water consumed. In many of the fatal cases the patient had drank a great deal of pump water, and a number died within a week or two after the attack, showing intensity of the poison.

Well, corner of First and K Streets NE.—Twenty-two cases, 8 of which were fatal, were consumers of water from this well. This would be a terrible mortality, and while I am sure that I investigated all the fatal cases, I can not be certain that all the recoveries came under my observation. The pump is located 64 feet from a sewer (the streets are unpaved, maple trees on K street), and as fecal bacteria were demonstrated by Dr. Kinyoun in two samples of the water taken at different intervals, infection of the well may be fairly assumed. In spite of such evidence it is a very difficult matter to convince the average layman that a clear, sparkling, and very palatable pump water can and very generally is liable to the gravest form of pollution. He knows from observation that the Potomac water is at times loaded with sediment, and that it reaches in summer often a temperature of over 80°, which is far from palatable to the poorer classes who can not afford to buy ice, and of course he does not know that well water in its passage through the soil has been deprived of suspended matter without losing

some of the most dangerous properties. Many of the public wells are liable to sewage pollution, nor need we wonder when some of them are actually only within a few feet from a sewer, which, either by means of defective construction or defective joints from house drains, allow the intrusion of tree roots, and thus furnish an opportunity for leakage. But soil pollution may have taken place years before, and there are cases, like those of Metcalf in Ireland and Dr. Low's case of Helmsley, in which the specific virus must have remained latent for years until some change of environment called it again into a state of activity. Uffelmann has shown that the germs of typhoid fever may retain their vitality for at least a year in decomposing fecal matter. If for a year, why not for a longer period? The infective properties of a given pump water depend, of course, upon the presence of the specific germs. There are, however, good reasons for assuming that the germs of typhoid fever may be present at one time and not at another. Take, for instance, a pump located near a leaky sewer or house drain, the dejecta have been thrown into the closet at a certain time and pass the leaky spot in a given time. If the well is full to its average depth the germs may pass beyond the radius drained by it, while if the water is low the conditions are favorable for admission. But even after the germs have gained access to a well they are not likely to remain there, as the water is constantly pumped out and replenished from the subterranean waters, hence it is evident that wells may be pure one minute and infected the next and the specific germ may again be absent in a day or two, so that even the result of a bacteriological examination may mislead us. Fourteen consumers of the water from the pump corner K and First streets NE. were also consumers of Potomac water, but, as a rule, during the hot weather preferred the pump water.

The infected houses were supplied as follows: Water-closets in house, 10; water-closets in yard, 4; box privies, 8. Three of the latter found in a leaky or overflowing condition.

Eight fatal cases—white, 5; colored, 3.

Well, corner Second and G Streets NE.—A group of 18 cases, 6 of which were fatal, was found in consumers of water from this well located within 11 feet from a sewer (asphalt pavement and sycamore trees), but both the bacteriological and chemical examination furnished no proof of the contamination. When we recall the various factors likely to influence the presence or absence of disease germs, I can only say, that while their presence would be absolute proof of infection, their absence in a given sample of water is no indication that they were never present.

Of the 18 cases 11 were exclusive consumers of this pump water and 7 were also consumers of Potomac water.

Water-closets in house, 1; water-closets in yard, 15; box privies, 2.

Six fatal cases—white, 5; colored, 1.

Well, corner Fourth and E Streets NE.—Five cases were traced to this well, which is located 15 feet from a sewer (maple trees in vicinity, asphalt pavement on E street, gravel road on Fourth street).

The cases occurred in 5 different houses, supplied as follows: Water-closets in house, 2; water-closets in yard, 2; box privy, 1.

Two deaths—white, 1; colored, 1.

Two of the above cases occurred on Groff street where the emanations from the sewer were very offensive. In a case on Acker street (square 861) the cesspool in the yard had been overflowed for three weeks prior to the attack.

Well, corner Eleventh and F Streets NE.—Nine cases occurred in consumers of water from this pump. The bacteriological examination revealed no suspicious bacteria in the water, and as 5 of the 9 cases occurred in adjoining houses on I street, between Tenth and Eleventh NE., the infection was probably conveyed by other channels.

The first case on I street occurred on July 28, at No. 1016, the next case, August 10, in No. 1014, followed by 2 other cases in the same house, August 22 and September 15. Another case occurred at No. 1010, October 24. The houses in the entire row are supplied with box privies, and the general surroundings are very unsanitary. There was nothing in common in the milk supply, and the fact that the cases occurred at considerable intervals indicated with more or less certainty that the first case was a focus of infection; but how the germs were carried, unless by flies, or through the air, is a matter impossible to determine.

The houses referred to were supplied as follows: Water-closets in house, 1; water-closets in yard, 1; box privies, 7.

One death, in the person of a white girl aged 17.

In addition to these groups I examined 35 cases in the northeast, of which 7 were fatal, scattered over different parts of this section. Some of the squares, like Nos. 721, 722, and 723, presented a large number of cases. The houses in the first two squares are built upon "made soil," while those in square 723 occupy high and natural ground.

Several of the families received their milk supply from suspicious sources in the extreme northeast.

Deaths, 7—white, 5; colored, 2.

Twenty-five of the 35 cases were consumers of Potomac water; 6 had drank both Potomac and well water, 3 had been consumers of spring water, 2 from a suspicious spring in the yard of the Baltimore and Ohio Railroad depot near Delaware avenue, and 1 was an exclusive consumer of Columbia lithia water.

The houses were supplied as follows: Water-closets in house, 19; water-closets in yard, 13; box privies, 3.

A summary of the evidence reveals the fact that of the 89 cases in the northeast, 60 were consumers of well water; 25 were consumers of Potomac water; 3 were consumers of spring water; 1 was a consumer of Columbia lithia water. Twenty-seven of the 60 consumers of well water had also been occasional consumers of Potomac water.

The 89 houses were supplied with methods for the disposal of excreta as follows: Water-closets in house, 33; water-closets in yard, 35; box privies, 21.

The general sanitary condition of the northeast is by no means bad, and the majority of the infected houses have sewer connections. A number of squares between North Capitol and First street NE., occupy the bed of Old Tiber Creek, and the houses are built upon "made soil," with uncemented cellars, thus allowing free access of the ground air from polluted subsoils, which doubtless is a strong predisposing cause to disease, especially in cities with impermeable pavements; nevertheless the baneful effects of contaminated wells are strikingly illustrated, and, as in the suburbs, so here I am forced to conclude that they have furnished the largest quota of cases.

SOUTHEAST AND SOUTHWEST.

I have investigated 97 cases in these sections, 48 in the southeast and 49 in the southwest.

Southeast.—Southeast furnished 13 imported cases, leaving a balance of 35 cases contracted in the city; of these, 14 were fatal; but it should be understood that I examined everywhere a larger proportion of fatal cases, because the certificates of death furnished the location, while for recoveries I had to depend upon information cards or inquiry in the neighborhood.

Among the 14 fatal cases—white, 6; colored, 8; 10 were consumers of well water; 4 were consumers of Potomac water. Three of the consumers of well water received their supply from the pump on E street between Twelfth and Thirteenth SE.

The 14 houses were supplied as follows: Water-closets in house, 2; water-closets in yard, 4; box privies, 8. Four of the box privies in a leaky condition.

Of the 21 recoveries, 13 were consumers of well water; 8 were consumers of Potomac water exclusively. Seven of the consumers of well water also drank, occasionally, Potomac water.

The cases occurred in houses which were supplied as follows: Water-closets in house, 8; water-closets in yard, 5; box privies, 8.

One of the privies contained a barrel partly sunk in the ground, and 3 of the boxes were found to be leaky or full to overflowing. One case occurred at No. 803 I street SE., in a very good house, located near a private alley, which was defiled with excrement by frequenters of an adjoining saloon.

One case received milk from a grocery at No. 1300 E street while typhoid fever prevailed there.

In square No. 1041 there is an alley on the east and in rear of lot No. 1322. Harrison avenue, which is used by the residents of that section as a place for deposit of human filth, garbage, and other putrescible material, and the collection is kept moist from the drainage of the houses on Harrison avenue and C street in the same square.

On September 11 a colored man was taken sick at No. 1325 O street, and the dejecta were thrown into a leaky and overflowing box privy. On September 29 a child aged 11 years was taken sick at 1322 Harrison avenue, and there is much reason for assuming that infection was carried from the unsanitary conditions referred to.

Southwest.—Of the 49 cases investigated by me in this section, 6 were imported, leaving 43 cases as having been contracted in the District. Of these, 16 were fatal, only 4 of the 16 cases were consumers of well water, while 12 were consumers of Potomac water.

The premises were supplied for the reception of fecal matter as follows: Water-closets in house, 5; water-closets in yard, 6; box privies, 4; privy pit, 1.

Deaths—White, 9; colored, 7.

Of the 27 recoveries, 16 were consumers of well water; 11 were consumers of Potomac water. Thirteen consumers of well water also drank, occasionally, Potomac water.

The houses were supplied as follows: Water-closet in house, 8; water-closet in yard, 13; box privies, 5; no privy upon premises, 1.

In a fatal case at 1701 Twelfth street SW., the family kept cows and evidently raised vegetables for the market. The privy, a mere excavation in the ground, was 35 yards from the well, and the kitchen drain emptied within a few feet from the well. The house was infected with diphtheria last spring.

A fatal case occurred in No. 1343 South Capitol street, and while the sanitary condition of the house was good, the family suffered from the disagreeable odors of box privies, unlawful surface drainage, and the filthy condition of some of the vacant lots in close proximity. Another case occurred later at No. 15 O street, in the same square, and as the general surroundings predisposed to the dissemination of the disease, especially the leaky box privies, I recommended, in the interest of public sanitation, a house to house inspection. The results are stated by Sanitary Inspector E. W. Whitaker, as follows:

"All properties in this vicinity were recently inspected by me and notices duly served on those responsible to abate all nuisances found. The privy boxes in the frame row of houses on the north side of O street, between South Capitol and First streets SW., were all found to be full and filthy and four of them leaky.

The tenants promptly cleaned the boxes on notice to do so. * * *

The large open lot at corner of South Capitol and O streets, and immediately south of these houses, I found was used as a dumping ground for all kinds of refuse and filth.

There appears to be a leaky water pipe in rear of 1349 South Capitol street, which only an expert can locate.

A summary of the evidence shows that in the 78 cases contracted in this sanitary district, 43 were consumers of well water; 35 were consumers of Potomac water. Twenty of the consumers of well water also occasionally drank Potomac water, but in all such instances it may be fairly assumed that during the hot months of July, August, and September the well water was largely preferred.

Sewer connections existed in 51 premises, as water-closets were found in 23 houses and closets in 28 yards. Twenty-five premises had box privies, one had a privy pit, and No. 106 Q street SW. had no privy of any description.

In a large number of the cases, especially in the southwest and along the Eastern Branch of the Potomac, the system was very much debilitated by malarial cachexia, prior to the attack. What effect the St. James Canal, the backing up of sewage, and consequent flooding of uncemented basements and cellars, or the emanations from the filth-reeking shores of the Eastern Branch of the Potomac, may have had as a contributory factor it is difficult to say, except that backing up of sewage means soil and water pollution and all the conditions which, in the judgment of sanitarians, constitute fruitful sources of disease. The sanitary environment of the individual homes can in a measure be judged by the fact that the colored population furnished 50 per cent of the fatal cases.

CENTRAL DISTRICT—FROM NORTH CAPITOL TO THIRTEENTH STREET NW., NORTH OF THE PUBLIC GROUNDS AND SOUTH OF THE BOUNDARY.

I have investigated 104 cases in this section, 12 of which were contracted at summer resorts and 92 at home. Of the 92 cases, 21 were fatal cases, 7 among the white and 14 among the colored race. Of these, 11 were consumers of well water; 8 were consumers of Potomac water; 1, melted Kennebec ice; 1, consumer of Columbia lithia and Potomac water.

The method for the disposal of human excreta in the 21 houses was as follows: Water-closets in house, 7; water-closets in yard, 11; box privies, 3. Of the 71 other cases, 43 were consumers of well water; 26 were consumers of Potomac water; 1 was a consumer of melted Kennebec ice; 1 was a consumer of Potomac and occasionally o Columbia lithia water.

A pump on H street, between Fourth and Fifth streets NW., which was found to be contaminated, and closed September 7, contributed 3 of the fatal cases; the well, corner of New Jersey avenue and Pierce street, contributed 3 fatal cases and 8 other cases; 5 of the cases were consumers of water from the artesian well in the Palais Royal; the pump on corner of Tenth and N streets furnished 4 cases; and the pump on Caroline street and the one on North Capitol and Randolph, each 2 cases, and the pump on Sixth, between F and G, 3 cases. (See Dr. J. J. Kinyoun's report for result of bacteriological examinations.)

The 71 cases occurred in 63 houses, supplied as follows: Water-closets in the house, 43; water-closets in the yard, 16; water-closets in the cellar, 1; box privies, 3.

In 7 of the houses there was defective plumbing; in one instance, on Kingman place, a defective drain from the water-closet passed through the bedroom; in another case the patient occupied a bedroom supplied with an unventilated stationary wash basin; in

one instance there had been an overflow of sewage from defective drains two weeks before the attack; in one instance, in the rear of 1017 Ninth street, the patient slept next door to a water-closet or large tank constructed to accommodate several persons, but without proper ventilation, and which was used by a number of families; in three instances the milk supply was derived from infected houses.

One of the nurses at Children's Hospital contracted the disease in the line of her duty.

A trained nurse also attributed her attack to nursing a typhoid fever patient. Another case occurred in a lady who only for a short time, during the extreme illness of a neighbor, came into intimate contact with the patient.

In another instance a colored girl was in service where a case of typhoid fever occurred July 9, and the patient died August 18. The servant was taken sick August 17 and taken to her home; the disease was conveyed to one of her sisters September 19, and a brother, aged 18, developed a case October 14. An explanation of the channels of infection in such cases has been offered in preceding pages. In 1 case the mother of the boy attributed the attack to his fondness for bathing in polluted streams.

Five cases occurred in residents near the power house on Brightwood avenue, and while they were not typical and have not been included as typhoid fever, they are at least suggestive, as the evidence shows that a continued fever, lasting in different individuals from a few days to fourteen days, developed in inmates of 3 houses, all consumers of well and spring water, which was found, upon bacteriological examination, to be polluted. (See Dr. Kinyoun's report.)

Summary.—Of the 92 cases investigated by me, and found to have been contracted in the District, 54 were consumers of well water; 34 were consumers of Potomac water; 2 were consumers of melted Kennebec ice; 2 were consumers of Potomac and Columbia lithia water.

The methods for the disposal of excreta in the houses were as follows: Water-closets in the house, 50; water-closets in the yard, 27; water-closets in the cellar, 1; box privies, 6.

The marked frequency of the disease among consumers of well water is apparent, and other modes of dissemination can not be ignored.

NORTHWEST—FROM THIRTEENTH STREET TO ROCK CREEK.

I investigated 59 cases in this section, of which 16 were contracted at summer resorts, leaving 43 cases to be disposed of. Of this number 9 were fatal cases, 3 of which were colored and 6 white. Six were consumers of well water; 3 were consumers of Potomac water. The consumers of well water also drank, occasionally, Potomac water.

The cases occurred in houses supplied with methods for the disposal of excreta as follows: Water-closets in house, 5; water-closets in yard, 1; box privies, 3. Of the 34 other cases, 20 were consumers of well water; 13 were consumers of Potomac water; 1 was a consumer of melted Kennebec ice and Potomac water.

The houses were supplied for the disposal of human excreta as follows: Water-closets in house, 19; water-closets in yard, 11; box privies, 4.

Of the pumps, the one on corner Twenty-seventh and K contributed 3 fatal and 4 other cases; the pump on T, between Seventeenth and Eighteenth, 1 fatal and 2 other cases; pump on Caroline street, 1 fatal and 3 other cases; pump on M and Twenty-third streets, 6 cases. For results of the bacteriological examination of the wells see Dr. Kinyoun's report.

In 1 case a young man of respectable parentage and very fond of milk attributed his sickness to drinking milk which had a decided "rotten-egg flavor."

A colored girl on Twenty-fifth street had drank water and eaten apples at an infected house on Q and Thirty-fourth street, Georgetown.

Two cases occurred at 2151 Pennsylvania avenue on the second floor of a house, occupied below by a filthy butcher shop, which had been vacated a short time before. This case is mentioned because some very competent observers have commented upon such incidents, and the family was positive that there was a causative relation between this filthy shop and the occurrence of typhoid fever.

Summary.—Of the 43 cases in the northwest, 26 were consumers of well water; 16 were consumers of Potomac water; 1 was a consumer of Potomac water and melted Kennebec ice. All but 2 of the consumers of well water also drank Potomac water.

Water-closets in house, 24; water-closets in yard, 12; box privies, 7.

Twenty-six of the cases occurred in the white and 17 in the colored race.

The distribution of the cases is shown on the map, and personal inspection reveals the gratifying fact that sanitary homes, with occupants who are careful in the selection of their drinking water, furnish the least number of cases.

GEORGETOWN.

I have investigated 24 cases in this section, 5 of which were contracted at summer resorts; of the 19 remaining cases, 6 were fatal—4 in consumers of well water; 1 in a consumer of Potomac water; 1 in a consumer of water from a spring located in the cellar.

The houses were supplied as follows: Water-closets in house, 3; water-closets in basement next to kitchen, 1; box privy, 1; privy barrel, 1.

Of the 13 other cases, 10 were consumers of well water; 3 were consumers of Potomac water.

The houses were supplied as follows: Water-closets in house, 7; water-closet in yard, 1; box privies, 5, 4 of which were found to be leaky or full to overflowing.

The well on Thirty-fourth street, between O and P, contributed 4 cases, and a well at 1614 Valley street, 2 cases. Twelve of the patients were white, 5 colored; 2 of the 5 fatal cases were colored persons.

In one of the fatal cases, the water-closet was found in the basement, 12 feet from the kitchen range, and no partition except a curtain to separate the kitchen from this apartment. The water-closet was the ordinary rim-flush basin. This family had diphtheria cases last year, and although the house is quite modern and comparatively new, I am not surprised at the occurrence of these diseases under such circumstances. In one of the cases it is probable that the disease was contracted at Brightwood, and in another at Ivy City, the patients having worked or remained at these places sufficiently long for the incubation of the germs. In one instance the patient had drank spring water while out hunting, two weeks before the attack. In the house of a family with 3 cases, I found a box privy full to overflowing. The mother informed me that the first case occurred in April, and that she buried some of the dejecta in the yard not over 100 feet from a public pump. Bacteriological examination of the water has not revealed the presence of dangerous germs.

Summary.—Of the 19 cases, 14 were consumers of well water; 4 were consumers of Potomac water; 1, consumer of water from a spring located in the cellar and liable to seepage.

CLINICAL SUMMARY OF 500 CASES OF TYPHOID FEVER IN RELATION TO RACE, AGE, AND PERCENTAGE OF DEATHS FURNISHED BY THE WHITE AND COLORED RACES.

Of the 500 cases investigated by me, 371 were cases of recovery and 129 were fatal cases. No conclusions as to the fatality of the disease can be drawn from these figures, for while the ratio of fatal cases investigated to the total number of fatal cases which occurred is positively known, the same information can not be obtained as to the cases of recovery, reports concerning which were incomplete.

Of the 500 cases, 380 occurred among the white and 120 among the colored race.

Of the 129 fatal cases investigated by me, 77 were of white and 52 of colored persons, and of the 149 deaths from typhoid fever during the four months ending October 31, 1895, 87 were white and 62 colored. These figures indicate that while the colored race constitutes only about one-third of the population of the District of Columbia, they contributed 41 per cent of the fatal cases of typhoid fever. The 500 cases were distributed to age as follows:

From 1 to 5 years	15	From 41 to 50 years	24
From 6 to 10 years	59	From 51 to 60 years	15
From 11 to 20 years	184	Over 60 years	4
From 21 to 30 years	143		
From 31 to 40 years	56	Total	500

The youngest patient was 18 months old, the oldest patient 74 years.

SUMMARY OF 436 CASES OF TYPHOID FEVER CONTRACTED IN THE DISTRICT IN RELATION TO THEIR WATER SUPPLY, METHODS FOR THE DISPOSAL OF EXCRETA, AND OTHER CAUSES.

Well Water.—Of the 436 cases contracted in this District 132 were exclusive consumers of Potomac water and 289 were consumers of well water, and while 186 of this number also drank occasionally Potomac water, for reasons already given, their principal water supply during the heated term was derived from the pumps; 5 were largely consumers of spring water, 4 of cistern water; 1 exclusive consumer of Columbia lithia water; 2 consumers of Potomac and Columbia litha water; 2 exclusive consumers of melted Kennebec ice; 1 of melted Kennebec ice and Potomac water. In order to indicate what

the final result of a careful examination of our pump water is likely to be, it should be stated that at the end of 1890 there were 271 public pumps in service. From 1890 to June 30, 1895, 102 of these were abandoned, because the water after repeated chemical examination was found to be dangerous to health. During the last fiscal year 2 deep wells were driven, leaving July 1, 171 public pumps in service, not to mention the number of private pumps of whose existence we have no official knowledge; I am satisfied that they are being constructed even now within the city limits, as I encountered one in Southwest, completed during the year, and the water of which was found to be contaminated. The location of the pumps in service July 1, 1895, and their relation to sewers are shown on map II; the wells abandoned since July 1, 11 in number, as also those found upon bacteriological examination by Dr. Kinyoun to be contaminated are indicated by a red circle. It should be remembered that such examinations were only made in case of suspected waters, and the question naturally arises, why should this process of closing the pumps be extended over a number of years, when the results of both the chemical and bacteriological examinations in the past show the majority of the specimens to be contaminated and none above suspicion. Sufficient evidence has been adduced to show that the use of such water, wherever soil pollution has taken place, is fraught with danger, and the numerous sources of soil pollution have been pointed out. The results of a bacteriological examination can not be relied upon to determine the freedom from danger, because an instance has been adduced which demonstrates that dangerous contamination did exist in a well September 17, and all evidence disappeared in a sample taken September 22.

Potomac Water.—What is the relation, if any, between Potomac water and the prevalence of typhoid fever in the District? While the Potomac water compares very favorably as regards purity with other rivers, there is much reason for believing that it is not at all times free from danger. There are of course a number of competent men, who, on account of the character of its watershed and the comparative absence of large towns above the intake, believe there is little or no danger from specific contamination, especially as none of the towns are sewered. These towns range from 44 to 125 miles in distance from the city. They appear, however, to disregard the contaminating influence of a town, or of settlements, on rivers, which has been well established by chemical and bacteriological analyses. We have the bacteriological examinations of Theobald Smith to show that turbidity of the Potomac water is always accompanied by a larger amount of organic matter and germs, and that fecal bacteria and turbidity are also coincident, and there can not be a successful concealment of the fact that the same showers that bring to us large sections of pulverized river banks also wash through barnyards, cesspools, and outhouses before finding their way through creeks to the Potomac and the reservoirs. While it is true that so far no typhoid fever germs have been isolated from the Potomac, the bacteriological examinations conducted by Dr. Kinyoun during the past two months have repeatedly demonstrated the presence of the colon bacillus, and this, too, when the water was perfectly clear. This same condition has been observed in the bacteriological investigations conducted last year at the Army Medical Museum, and Dr. Billings, in speaking of these results, said: "At certain times of the year the river water is so loaded with sediment as to be unfit for bathing as well as for drinking and cooking purposes. It contains fecal bacilli at all times, although these are probably for the most part derived from the excreta of horses and cattle, and not of man. And it is probable, although not proven, that it at times contains organisms or substances capable of producing diarrhea in persons not accustomed to its use, and the typhoid bacillus is not absolutely excluded from it, although it has never been actually found in it."

This is the conservative statement of one of our most competent sanitarians, in an address to the Medical Society in the District of Columbia, delivered October 24, 1894. I have had grave suspicions for several years that some of the fecal bacteria were derived from human excreta and desired to convince myself by a personal inspection in the present investigation, but as time and the emergency fund were limited, the following circular was addressed to physicians residing in ten towns along the Potomac or its tributaries:

"NOVEMBER 11, 1895.

"DEAR SIR: In view of the large number of deaths from typhoid fever in this city since July 1, 1895, this Office is now engaged in an investigation into the causes of this disease, and I should be glad to receive from you information on the following points:

"1st. Have you found typhoid fever more prevalent than usual during the period mentioned?

"2d. How many of your patients were consumers of Potomac water or one of its tributaries?

"3d. How many of your cases resided along water courses which empty directly or indirectly into the Potomac River?

"4th. Have your cases been of a more malignant type than usual during the past four months?

"5th. Do you know of any source by which the Potomac River or its branches are subject to pollution, especially from the wastes of human life? Since the bacteriological examination of the water reveals the presence of fecal bacteria, it is of especial interest to know in how far the water is liable to contamination from infected privies along the runs which ultimately empty into the Potomac River.

"I inclose penalty envelopes, and in the interest of public sanitation I hope to hear from you at an early day; your assistance will be greatly appreciated and duly acknowledged.

"Respectfully, WM. C. WOODWARD, M. D.,
"*Health Officer.*"

Original Sources of Pollution.—Replies were received from eight physicians representing six localities. The source of one reply could not be determined, as the physician simply added his answer to the questions without further identification. Dr. C. S. Hoffman, from Keyser, W. Va., in answer to question 3, writes: "Keyser is so situated if any drain takes place it must drain into the Potomac River. Then, again, I have seen the contents of privy boxes emptied into the Potomac River. This last matter has, however, been prohibited by the town authorities, and I do not know of its occurrence since or directly before the term you mention, July 1, 1895. * * * Now, the privy boxes of the town are mostly emptied on a slate hillside about half a mile from the town and in such a place that a heavy rain can wash it down into New Creek within half a mile of where it empties into the Potomac River."

Dr. Thomas H. West, of Keyser, in reply to the fifth question, answers "I do not."

Dr. A. S. Reynolds, from Shepherdstown, W. Va., writes: "The greatest source of pollution of the water of the Potomac is the canal. All slops and filth of every kind, dead animals, manure from stables are thrown into the canal by boatmen, and the people living along it also use it for very much the same purpose. The water from the canal is continually wasted by leaks into the river, which must be a great source of pollution."

Dr. J. S. Fleming, of Shepherdstown, W. Va., says: "Yes, there are privies and hogpens, which pollute a small run passing through the town."

Dr. V. L. Parry, of Charlestown, W. Va., replies "Yes" to the first question, "One" to the third question, and "No" to the other questions.

Dr. M. L. Gannon, Williamsport (?), Md., replies to the fifth question: "I do not; there are some isolated places, but not emptying directly into river; only one privy."

Dr. B. B. Ransom, of Harpers Ferry, in reply to question 5, says:

"The only source of contamination that I know of in this vicinity is the immense quantity of wood shavings from two pulp mills at this point which fills the bottom of the Potomac River for miles, and are thrown out on the banks, where, decaying, become very foul. In addition to which large numbers of fish and eels are cut up by the wheels of the pulp mills and furnish a considerable amount of animal matter to the water."

Dr. H. B. Miller, of Cumberland, writes: "The entire outlet for waste material here is the Potomac River; all closets are cleaned and refuse deposited (on soil drained into) or dumped direct into the river, while many closets and sewers open direct into streams which flow (when it rains) into the river. The unusual dry spell has prevented the washing out and consequent distribution of the closet germs, and the highly colored condition of Potomac River water here has compelled people to use well or other water brought from a distance. We have had very little sickness from epidemic troubles. When high water clears the coloring matter out and washes in the closet accumulation, I fear we will be able to report almost any disease epidemic."

TYPHOID FEVER AT CUMBERLAND, MD., AND ITS POSSIBLE RELATION TO THE INCREASE OF THE DISEASE IN THE DISTRICT OF COLUMBIA IN 1889–1890.

A study of the typhoid fever epidemic, which prevailed in the above city from December 1889 until the spring of 1890, shows that the disease was not present until the discharges from a case of typhoid fever living on one of the little runs, which empties into the Potomac about 300 feet above the pumping station, found their way into the city water supply.

Dr. W. W. Wiley, of Cumberland, wrote me June 25, 1890: "This epidemic first appeared in the case of a young man who returned from Ohio quite ill about the 10th of December, 1889; this case terminated fatally on the 20th of the same month. The next case appeared January 10, 1890, and since then we have had about 485 cases. Our population, 12,000. Every case but one can be traced to the use of our river water.

I am not aware of any case occurring just below Cumberland, as no one used the water, but I am informed that several cases occurred at Hancock, which is 30 miles below Cumberland, and which could be traced to the drinking of the river water."

The records of your office show that typhoid fever prevailed to an unusual extent in this city from December, 1889, to April 30, 1890, as the deaths for these months from typhoid fever amounted to 74, as compared with 42 for the corresponding months of the previous year.

CAN A RIVER, ONCE POLLUTED, EVER BE A SAFE SERVICE OF SUPPLY BELOW THE SURFACE OF POLLUTION?

It is clear that a river, after it receives the sewage of a number of towns, can not be as pure as before, and the question naturally arises, Can a river, once polluted, ever be a safe source of supply below the source of pollution? The question of self-purification of rivers has been earnestly studied, and the conclusion has been reached that a certain degree of purification is possible by natural means, viz:

1. Dilution of the sewage with clean or unpolluted water which empties into the stream along its course.
2. By deposition of the suspended matter carrying with it some of the organic material.
3. By the agency of fish, water plants, algæ and infusoria, which require organic matter for their food.
4. By the bacteria of nitrification which are so largely instrumental in the process of oxidation of organic matter; it has been shown that the mere presence of oxygen in water without these bacteria does not lead to a perceptible diminution of organic matter.
5. The rapidity of oxidation is influenced by the volume of organic matter present, the temperature of the water, the distance of the run, also whether the stream has a wide surface exposed to the sun and air, the rapidity of the current and the character of the river bed.

The various factors named are calculated to purify the water in our river, provided we give it a chance, but with increasing settlements it is possible that practically here, as elsewhere, the pollution becomes continuous from its source to the reservoirs. The statement of Dr. Tidy and other chemists who declare that even a flow of even 10 or 12 miles is sufficient to free a river of all trace of sewage contamination is no longer credited, especially since the Massachusetts state board of health for 1876 reports an outbreak of typhoid fever in a hospital using river water, which was traced to an infected barrack 25 miles up the stream.

As we can hardly believe that pollution is tolerated in close proximity to the "intake" of our river water, I submit that the almost constant presence of fecal bacteria is evidence of some distant source of pollution, and that they have not been destroyed by the agencies which are believed to be all sufficient by the advocates of the theory of "self-purification of streams."

While it is true that the specific germs of typhoid fever have never been demonstrated in Potomac water, it is equally true that they were not demonstrated in the well at Takoma, which infected eleven persons, where the bacteriologist simply found the colon bacillus, which is a positive evidence of fecal contamination. But all this is not very surprising when it is considered that the best bacteriologists frequently fail to find the germs of typhoid fever under conditions strongly suggestive of their presence. This is not a matter of theory but it is the concensus of opinion of those best qualified to judge, that while a stream under favorable conditions undergoes a certain degree of self-purification, we can not rest satisfied that dangerous contamination does not exist, and such water is unsafe for drinking purposes unless it has been subjected to filtration by means of filtering beds; the necessity for purification is clearly apparent from the evidence presented by physicians residing along the original source of pollution. The effects of a pure water supply upon the decrease of typhoid fever has been abundantly demonstrated in various cities, and the very fact that filtering basins eliminate from 90 to 98 per cent of all germs, is the best indication that they will remove a corresponding number of disease germs. The question as to how much of the immunity from typhoid fever in the northwest section is due to the use of domestic filters and sterilization of the water by boiling, can not be decided except by a census of all the houses, but in my judgment these precautions have been quite general and proved of great benefit. Körösi, of Budapest, has proved by statistics that of 7,000 residents in the most fashionable part of his native city, those who used filtered water contributed 9.3 cases per 1,000, while the consumers of unfiltered water furnished 14.1 cases per 1,000.

METHODS FOR THE DISPOSAL OF HUMAN EXCRETA.

Of the 421 infected houses, 261 had sewer connections, 152 had privies, 2 had cesspools, 4 had surface privies or sinks, and 2 had no privies. A census taken in 1893

showed the presence, in round numbers, of 43,000 houses in the city and 7,000 in the county, with 8,959 box privies within the city limits and 5,133 in the county. Since that time, it is safe to estimate from the building permits that 2,000 additional dwellings have been built and more sewer connections have been made. No official records are kept as to the exact number of box privies now in service, but judging from the statement of the Odorless Excavating Company the number within the city limits has probably decreased to about 7,000, with an increase to about 6,000 in the suburbs, making a total of 13,000 box privies now in use in the district. This leaves 39,000 houses supplied with sewer connections and 13,000 houses with box privies and ordinary makeshifts, and it is a noteworthy fact, that while the 30,000 houses with sewer connections contributed 261 of the typhoid fever houses, the 13,000 houses supplied with makeshifts furnished 160 infected houses. Map III shows the distribution of box privies in 1893. The role they play in factors in soil, water, and air pollution is best judged by the fact that during the fiscal year ending June 30, 1895, the sanitary inspectors reported to your office 4,372 box privies as "full," 746 as "leaky," 5,201 "filthy," and 230 "dilapidated." These boxes, even if there were no wells, are still a source of danger in so far as they favor the transmission of germs by means of infected flies, nor can the possibility be ignored that these organisms in leaky or overflowing boxes may reach the upper layer of the soil and with pulverized dust gain access to the system.

It has been proven over and over again that while the rate of typhoid fever diminished after the introduction of a good water supply, the effects are still more marked when combined with a good system of sewers.

IMPURE ICE AND MILK.

The relations of impure ice and milk supplies to the prevalence of typhoid fever in this city have not been prominently developed in this investigation. This is due to the fact that in many instances the household did not even know the name of their dairyman, or that they purchased milk from groceries, who in turn received their supply from several shippers. With the enforcement of the recent laws upon the subject it will be possible to trace the source of many obscure milk infections. From the above evidence and also because of the very impure condition of the dairy waters examined by Dr. Kinyoun it is safe to assume that typhoid fever has to a certain extent been disseminated through the medium of the milk supply. There were two cases who, instead of drinking well or Potomac water, preferred the drippings of melted Kennebec ice, and used it during the summer months, forgetting the fact, if they ever knew, that ice may be as impure as the water from which it is obtained. Another case used melted Kennebec ice largely, but also used Potomac water occasionally. Dr. Kinyoun has examined the ice supplied by seven different companies in this city, and found some of the specimens contaminated with sewage bacteria. The results of his investigation will be seen by reference to his report. Some of the artificial ice companies use filtered Potomac water, while another, after filtering the spring water, subjects it to a thorough boiling. The ice company located on the river above the Aqueduct Bridge derives its ice in part from the Potomac, cut at that point, but unfortunately no samples could be had, as the supply from this source was exhausted, but there can be no question that the sources of our local ice supply should be closely watched.

I regret that want of time and the overworked state of the bacteriological laboratory did not permit the extension of this inquiry into the condition of soda and other carbonated waters, many of which are doubtless derived from polluted sources.

The possibility that infection may be conveyed by means of excreta when used as fertilizer should not be overlooked, as I am informed that the excavating company disposes of its collections to those willing to use it.

CONCLUSIONS.

The facts presented in the foregoing pages justify the following conclusions:

First. Typhoid fever has increased with almost uninterrupted uniformity in this District during the past twelve years, indicating the persistence of local causes.

Second. Typhoid fever is more prevalent in the suburbs and in unsanitary portions of the District, indicating the encouraging fact that the causes are largely preventable.

Third. The rate of typhoid fever cases in certain parts of the city, like the northwest, is no greater than in some of the most healthy American cities.

Fourth. The majority of persons attacked were consumers of well water, many of which were found contaminated and none above suspicion.

Fifth. A large percentage of the cases occurred in houses supplied with box privies,

which, apart from being an important cause of soil pollution, are believed to be otherwise instrumental in the dissemination of germs, chiefly through the agency of flies.

Sixth. While the Potomac water compares favorably with that of other rivers as regards purity, no water supply from streams once polluted can be considered safe for drinking purposes without filtration or sterilization.

Since the experience of other cities, both at home and abroad, has demonstrated that typhoid fever is to a large extent preventable, I respectfully submit the following

RECOMMENDATIONS.

First. The immediate closing of every well in the District wherever a better water supply can be obtained.

Second. The early completion and extension of all necessary sewers within the city limits, and the enforcement of the law to make sewer connections.

Third. The abandonment of all box privies within the city limits and the enactment of more stringent laws for the prevention of soil pollution, together with a rigid, frequent, and systematic inspection of all box privies in the suburbs.

Fourth. The improvement of the Potomac water by means of filtering basins, and the extension of this water supply to the suburbs at the earliest moment practicable.

Fifth. Such measures as may be necessary to improve the sanitary condition in the lower part of the city, along the Potomac and the Eastern Branch, looking to the reclamation of stagnant and polluted marshes and the prompt disposal of the sewage.

Sixth. The enactment of a law requiring notifications to the health officer of all cases of typhoid fever and other infectious diseases in the District of Columbia, together with a rigid enforcement of the building regulations requiring the cementing of cellars and basements to prevent contamination of the air from polluted subsoils, and the systematic inspection of dairies inaugurated by you.

In the meantime, as a preventive measure, I earnestly recommend to the public the thorough disinfection of the excreta from all typhoid fever patients, and greater care on the part of those connected with the sick, together with boiling the water and milk supply.

A most conservative estimate demonstrates that the number of cases of typhoid fever for the four months ending October 31 was scarcely less than 795. These cases represented 30,800 days lost in sickness, at an average cost of $1 per day. Assuming an annual average of 1,500 cases, the loss amounts to $90,000 per annum, thus indicating that it will be in the highest degree wisdom, as well as economy, to apply a prompt, speedy, and effective remedy.

It affords me great pleasure to testify to the fact that my investigation tends to confirm the conclusions reached by the special committee appointed by the medical society of the District of Columbia, and so ably presented in their report submitted June 6, 1894. I tender to you my sincere thanks for your valuable assistance, and for selecting me for this duty.

Whatever merit this report may possess, its scientific value has been greatly enhanced by a series of painstaking bacteriological investigations of the water and ice supply conducted by Dr. J. J. Kinyoun, under the authority of Surgeon-General Wyman, of the Marine-Hospital Bureau.

In conclusion, I express my acknowledgments to Mr. Wm. B. Moore, the efficient statistician of your office, for valuable assistance, and for the preparation of the charts and tables; also to Mr. George H. Bailey, computing engineer, for the preparation of plats and the location of the old water courses on the city map.

Very respectfully, your obedient servant,

GEO. M. KOBER, M. D.

Typhoid Fever at Cumberland, Md.

[Extracts from the Medical News of Philadelphia, April 12, 1890.]

In another column we publish an account, obtained by sending a special correspondent to the spot, of the outbreak of typhoid fever which for four months has ravaged the town of Cumberland, Md. As will be seen by this article, the entire outbreak is dependent upon absolute disregard of the common laws of nature and health, and of the entrance into the water of a specific germ before the sickness which was prevalent became typical of enteric fever. Another interesting addition is made to our knowledge of the spread of diseases and their dependence upon an individual cause in many instances for their existence, and the world at large is treated to the sight of a

fairly intelligent body of citizens establishing a vicious circle between their mouths and the drainage of their houses and pigsties.

[Secial correspondence.]

Since the early part of December, 1889, the town of Cumberland, Md., has been subjected to an epidemic of enteric fever closely resembling in its cause and course that which occurred at Plymouth, Pa., some five or six years ago. While the mortality has been by no means so high, the causes of the disease are strikingly similar in both cases. Cumberland is a town of several thousand people, situated upon the Potomac River in a valley with steep and rather precipitous mountains surrounding it. The town depends for its existence chiefly on the railroads which center there, the largest of which is the Baltimore and Ohio. The population is a "railroad population," and is made up largely of persons in the middle walks of life. The drainage of the streets is surface drainage, and even this is exceedingly bad, while the rainfall is somewhat excessive and the entire town damp.

It will be seen, therefore, that in this instance a peculiarly favorable soil for such an epidemic was present, and the townspeople have, with a disregard of the plainest rules of sanitation, simply brought the disease upon themselves, as the following diagram and description will show:

"It will be seen that a line of privies a mile long empty directly over the bank into Wills Creek, this part of the town being made up of the poorest classes, and that two other lines empty themselves into the small 'runs' to the left of the diagram, while the entire drainage of the remaining houses eventually reaches the same streams, though not so directly. The position of the pumping station B is about 200 feet below the mouth of the two runs and on the same side of the stream, on the periphery of the bend. From the point where Wills Creek empties into the pool formed by the dam to the pumping station is about 100 yards, and this space is covered on the shore by several acres of garbage, over which pigs roam freely. If engineers had wished to plan a means of pumping sewage into a town instead of away from it they would not have succeeded more completely. But the stupidity permitting such an arrangement in the first place outdid itself some months later when a Philadelphia expert arranged to have the pipe from the pumping station carried to the opposite shore to get water before it was contaminated. As the stream is only about 100 or 200 feet wide, this is, on the face of it, absurd, since the pool formed by the dam consists in quiet water and not water rapidly flowing. Again, the mouth of the pipe being now on the short side of the bend soon became occluded by muck deposited there, while the water of the stream naturally followed the outer part of the course and kept the channel free. After the epidemic was established the city engineer found the pipe on the Virginia shore bent out of place and buried under 6 feet of mud, and that all the water supplied to the town was obtained from the old pipe on the sewage side of the stream.

"Having given an account of the water supply, let us turn to another interesting portion of this outbreak. Typhoid was not present until the discharges from a case of typhoid fever, living on one of the little runs at D, found their way into the city supply, although it is to be noted that a large amount of diarrhea of a dysenteric type had been epidemic and is now prevalent. In other words, the drainage of a large number of privies caused diarrhea and dysentery, but it required a case of the specific disease named to cause an outbreak of that affection."

REPORT ON THE WATER SUPPLY OF WASHINGTON, D. C.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL
MARINE-HOSPITAL SERVICE,
Washington, D. C., December 27, 1895.

SIR: Referring to your letter of September 19, 1895, relating to the increase of typhoid fever in the District of Columbia, and requesting the Bureau to engage in a bacteriological analysis of water, I transmit herewith a copy of the report of Passed Assistant Surgeon J. J. Kinyoun, in charge of the hygienic laboratory, giving results of analyses made by himself and his assistant.

I have the honor to remain, respectfully, yours,

WALTER WYMAN,
Supervising Surgeon-General Marine-Hospital Service.

HEALTH OFFICER, *Washington, D. C.*

OFFICE OF THE SUPERVISING SURGEON-GENERAL
MARINE-HOSPITAL SERVICE, HYGIENIC LABORATORY,
Washington, D. C., December 24, 1895.

SIR: We have the honor to submit the following as a report of a series of bacteriologic examinations, undertaken by your direction, at the request of the health officer of the District of Columbia. The work was done in conjunction with Dr. G. M. Kober, medical sanitary inspector, who had been specially charged with the investigation of the prevalence of typhoid fever in the District of Columbia during the past summer and fall.

The examination of samples of water was commenced on or about September 24 and continued without interruption until December 13, 1895, during which time 135 examinations were made.

The samples of water intended for this study were collected under special precautions by Dr. Kober and immediately brought to the laboratory.

The time of collection was usually in the morning before the water had been disturbed. This was for the purpose of taking the sample under the worst conditions, because if there was sewage pollution it would be more in evidence at this time. This plan was followed in all save a few secondary samples.

All the bacteriologic examinations were made with standardized culture media, in order to avoid the vexatious variations in results that would surely follow if this precaution was not taken.

The methods of isolating the bacteria from water are substantially the same as are recommended by others. At first, attempts were made to examine each sample for the number and classification of the bacteria, especially with reference to the presence or absence of the typhoid and colon bacilli, but this was abandoned in part, and our whole attention directed to the intestinal (colon) group of bacteria.

Preliminary to the examination, each sample was tested for the presence of fermentative bacteria, after the following manner: Five cubic centimeters of the suspected water was transferred to fermentation tubes containing freshly prepared lactose and glucose bouillon, respectively, and maintained at a temperature of from 41½° to 42° C. for forty-eight hours; the tubes were then examined for gas production. If any was present they were subjected to a further examination. If no gas had been formed it was assumed that no fecal or sewage bacteria were present, and no further examination of the specimen was made.

In several instances the fermentation tubes were cloudy and contained motile bacilli, which produced no gas. These tubes were repeatedly examined by the usual methods for the typhoid bacillus, but in no instance was it found.

As soon as possible after the sample was received the water was examined for the number of bacteria contained in each cubic centimeter. Definite quantities were planted in plates of glycerinized agar, and grown at 20° to 25° C. After from forty-eight to sixty hours the colonies were counted.

If the sample of water indicated the presence of fermentative bacteria, especially if both lactose and glucose were fermented, the culture was plated over into lactose litmus agar (Wurtz) and kept at 37° C. for twenty-four to forty-eight hours. If at the end of that time any of the colonies had acted upon the litmus they were transferred to other media, viz, fermentation tubes, gelatine, gelatine plates, litmus milk, potato, and tested for the indol reaction.

It was the rule to find that the high temperature of 41° to 42° C. was sufficient to inhibit the growth of the other varieties of bacteria present, and in those fermentation tubes which contained gas it was unusual to find other than bacilli.

In the accompanying table reference is made only to bacilli and their reaction, except in the column in which the colonies are enumerated. This includes all forms.

Samples which indicated, by the preliminary fermentative test, sewage or intestinal

bacteria were not usually examined a second time. If, on the other hand, a sample gave no such reaction, and there were facts pointing to its contamination, a second and other samples were required.

The secondary cultures demonstrated the fact that the bacterial contamination was one of a variable quantity; especially was this true with regard to wells. At one time a well in question would show nothing indicative of being contaminated with intestinal bacteria, and at another, one week later, they were present.

It is to be regretted that, owing to the large number of samples which it became necessary to examine, we were precluded from making secondary examinations from time to time in order to show the variation in the number of bacteria and the presence or absence of the fermentative forms.

The primary fermentative test, as suggested by Dr. Theobald Smith, has proven highly satisfactory. It can not be altogether relied upon as indicating the presence of fermentating bacteria, for in a few instances the primary cultures in both lactose and glucose gave gas formation; when they were subjected to plate cultures no colonies could be isolated which would ferment the same bouillon. Possibly this may be due to the hyperacidity, as suggested by Dr. Smith. But this does not seem applicable to all cases. We are inclined to believe that there may exist a symbiotic existence of bacteria, which together may possess this power, while independent they do not. This is a conjecture.

In the majority of the specimens which showed the gas reaction, in both glucose and lactose bouillon, demonstrated on further culture the presence of the colon group of bacilli.

The character of the colonies in gelatine are described under an objective of low power, and has been applied to all. This, however, was not necessary in many instances, but for the sake of uniformity was done as a matter of routine.

The reaction of the bacilli to litmus milk has been of great aid in classifying the several varieties, which give the same reaction in Wurtz agar and gelatine.

The indol reaction was best demonstrated after the culture had been tested and left standing for twenty-four hours.

Number of Bacteria.—The number of bacteria to a cubic centimeter of water is not a criterion of its purity. Some of the wells and springs contained great numbers, sometimes countless, yet they did not show that they were contaminated with any of the colon group. On the other hand, the converse was true; those samples containing as low as from 500 to 800 to the cubic centimeter contained a large number of fermentative (intestinal) bacteria. It must not be inferred, however, that waters containing large numbers of bacteria, even if they do show benign forms at the time of the examination, will continue to remain so. Sooner or later it is safe to assert that these will show the presence of sewage (intestinal) bacteria.

There were 70 examinations made of original samples of water, and 58 secondary examinations. From this number 21 bacilli were isolated, which answered in their morphological and cultural characters to the colon group.

Twenty-six samples contained bacilli, which belong to the sewage group. In 6 other samples the microorganisms could not be isolated.

In the accompaning table, the samples are classified either as contaminated with intestinal bacteria or as suspicious.

The Potomac water has also been examined, as will be seen, at intervals during this inquiry. The examinations, on the whole, make a better showing than the same number of wells. It was not found free from contamination. On two occasions intestinal bacilli were isolated, while more than one showed a contamination with sewage bacteria.

The number of bacteria in each cubic centimeter of Potomac water has not been above the average for this time of the year. In fact, they were less than were found in the

TABLE SHOWING RESULTS OF BACTERIOLOGIC ANALYSES OF WELLS, SPRI

NOTE.—Wells marked with an Asterisk (*) ar

No.	Source.	Date.	No. of bacteria.	Gas production. (Fermentation test, 5 c. c. of suspected water.)		Wurtz's litmus lactose agar.	Gelatine colonies slightly magnified.	Gelatine.	Motility.	
				Lactose.	Glucose.					
1	Well, 4th and E sts. NE	Sept. 24, 1895	725	Ferments	Ferments				Active	
2	Do	Oct. 4, 1895	900	do	do	Red colonies	Round, brownish, granular, irregular edges, slightly spreading.	Does not liquefy	Slight	Acid
3	Well, 1st and K sts. NE	Sept. 24, 1895	34,800	do	do					
4	Do	Sept. 26, 1895	1,500	0	0					
5	Well, G and 2d sts. NE	do	90	0	0					
6	Well, 2021 Seaton st	Sept. 25, 1895	180	0	Ferments					
7	Do	Oct. 3, 1895	36,000	0	0					
8	Do	Oct. 27, 1895	12,100	Ferments	Ferments	Red colonies	Hyalin and slightly granular	Does not liquefy	Active	Acid
*9	Mrs. Page's well, Takoma	Sept. 25, 1895	600	0	0				Slight	
10	Do	Oct. 27, 1895	12,800	Ferments	Ferments	Red colonies	Large, yellowish, granular, spreading.	Does not liquefy	do	
11	Do	Nov. 14, 1895	2,900	0	0				Active	
12	Spring at Takoma, rear B. and O	Sept. 26, 1895	3,960	Ferments	Ferments	Red and blue colonies	Brownish, dark centers, spreading	Does not liquefy	Slight	
13	Do	Oct. 5, 1895	3,300	do	do	Red colonies	Brown, round, fleshy	do	Active	
14	Well, 11th and F sts. NE	Sept. 26, 1895	10,700	do	0	do	Round, yellowish, granular, spreading.	do	Slight	
15	Do		800	do	Ferments	do	Round, pale-blue hyalin	do	Active	Alka
16	Do	Oct. 25, 1895	Innumerable	Ferments	0	do	Small, round, pale-blue hyalin	do	Slight	Acid
*17	Well, R. S. Wolfe, Brookland	Sept. 27, 1895	2,160	do	Ferments	do	Round, slightly granular, hyalin, spreading.	do	do	
18	The Takoma Spring	do	20,000	0	0					
19	Do	Oct. 5, 1895	800	0	0					
20	Well, E, bet. 12th and 13th sts. SE	Oct. 1, 1895	840	0	Ferments	Red colonies	Coarsely granular, fleshy	Does not liquefy	Active	
21	Do	Oct. 15, 1895	525	Ferments	do		Round, granular, fleshy	do	Slight	Acid
22	Well, 7th and B sts. SE	Oct. 2, 1895	220	0	do		Round, brown, granular	do	Active	
23	Spring, Franklin Square	do	800		do					
24	Do	Oct. 24, 1895	400	0	0					
*25	Well, 730 20th st. NE	Oct. 3, 1895	7,920	Ferments	Ferments	Red colonies	Yellowish, granular, spreading	Does not liquefy	Slight	Alka
26	Well, E, bet. 6th and 7th sts. SE	Oct. 2, 1995	180	0	0					
27	Do	Nov. 21, 1895		0	Ferments					
28	Well, N. Cap. st. above R st	Oct. 8, 1895	165	Ferments	do	Red colonies	Hyalin, irregular edges, spreading	Does not liquefy	Slight	Alka
29	Do	Oct. 21, 1895	2,700	0	do				Active	Acid
30	Do	Nov. 1, 1895	600	0	0	Blue colonies	Pale blue, granular, irregular edges, spreading.	Does not liquefy	do	
31	Well, rear No. 8 Minnesota ave	Oct. 9, 1895	120	0	0					
32	Well, No 9 Minnesota ave., Anacostia	Oct. 25, 1895	24,000	Ferments	0	Blue and red colonies	Pale, granular, irregular	Liquefies	Slight	Acid
33	Well, 27th and K sts. NW	Oct. 9, 1895	700	do	Ferments					
34	Do	Oct. 24, 1895	300	do	do					
35	Well, N. J. ave. and Pierce st	Oct. 9, 1895	800	0	do					
36	Do	Nov. 19, 1895	200	0	0					
37	Well, 403 Jefferson st	Oct. 9, 1895	700	Ferments	Ferments					
38	Do	Oct. 25, 1895	1,500	0	0					
39	Well, cor. 23d and M sts. NW	Oct. 9, 1895	400	0	0					
40	Well, M st., near 23d NW	Nov. 20, 1895		0	0					
41	Well, cor. 23d and M sts. NW	Nov. 2, 1895	10,500	Ferments	Ferments					
42	Well, 10th and N sts. NW	Oct. 9, 1895	330	do	do	Red colonies	Pale yellow, granular	Does not liquefy	Active	Acid
43	Do	Oct. 25, 1895	Innumerable	do	do					
44	Do	Nov. 19, 1895	700	0	0					
45	Well, cor. 4th and M sts. NW	Oct. 15, 1895	1,700	0	do					
46	Do	Nov. 2, 1895	2,600	Ferments	do					
*47	Well, 1739 T st. NW	Oct. 15, 1895	Innumerable	0	do					
48	Well, 490 M st. SW	do	800	0	do					
*49	Cistern, Ellegood, Ivy City	do	800	Ferments	do					
50	Do	Oct. 28, 1895	2,700	do	do	Red colonies	Dark, coarsely granular	Liquefies	Active	Acid
*51	Well, D. G. Cleveland, Ivy City	Oct. 15, 1895	2,600	do	do				do	
*52	Do	Oct. 28, 1895	4,200	do	do	Red colonies	Pale blue, granular, spreading	Does not liquefy	do	
*53	Well, Georgetown University (small boys)	Oct. 15, 1895	Innumerable	do	do	do	Brownish granular, slightly spreading.	do	Slight	
*54	Do	Oct. 25, 1895	2,900	do	do		do	do	do	
*55	Well, Georgetown University (large boys)	Oct. 15, 1895	2,700	0	do					
*56	Do	Oct. 25, 1895		0	do					
*57	Well, 132 Central ave., Ivy City	Oct. 15, 1895	15,200	Ferments	do	Red colonies	Brown, granular, spreading	Rapidly liquefies	Active	Acid
*58	Do	Oct. 28, 1895	9,700	0	0					
*59	Well, Miss Ross, Takoma	Oct. 17, 1895	500	0	Ferments	Red colonies	Hyalin, granular, irregular contour, spreading.	Does not liquefy	Slight	
*60	Do	Nov. 11, 1895	11,300	0	do	do	Pale-blue hyalin, spreading	do	do	
61	Spring, Brightwood ave	Oct. 17, 1895	500	Ferments	do	do	Pale hyalin, slightly spreading	do	Active	Alka
*62	Well, near Brightwood ave	do	26,900	do	do	do	Pale hyalin, granular, spreading	do	do	
*63	Well, 411 6½ st. SW	Nov. 20, 18.5		0	0					
*64	Spring, Georgetown University	Oct. 18, 1895	Innumerable	Ferments	Ferments	Red colonies	Small blue, surface colonies, spreading.	Does not liquefy	Active	Acid
65	Do	Oct. 25, 1895	500	do	do	do	Pale-blue hyalin, surface colonies, spreading.	do	do	
66	Well, 23d and M sts	Oct. 21, 1895		do	do	do	Brownish, slightly granular, spreading.	do	Slight	Alka
*67	Well of Judge Miller, Takoma	do	Innumerable	do	do	do	Yellowish, granular, spreading	do	Active	Acid
*68	Do	Nov. 11, 1895	6,350	do	do	do	do	do	do	
69	Well, 1614 Valley st	Oct. 24, 1895	200	0	0					
70	Do	Nov. 2, 1896	1,200	Ferments	0					
*71	Well, Wesley Heights	Oct. 21, 1895	2,900	do	Ferments	Blue colonies				
*72	Do	Nov. 19, 1895		do	do					
*73	Well, H. W. Scannel	Oct. 27, 1895	28,400	do	do	Red colonies	Yellowish, granular, spreading	Does not liquefy	Slight	Acid
*74	Do	Nov. 7, 1895	2,100	do	do	do				

S, SPRINGS, AND POTOMAC WATER IN THE DISTRICT OF COLUMBIA.

Asterisk (*) are private wells.

Motility.	Fermentation tube.				Litmus milk.	Potato.	Indol.	Remarks.
	Lactose buillon.		Glucose buillon.					
	Reaction.	Gas formula.	Reaction.	Gas formula.				
ctive					Coagulated fourth day		Considerable.	1 Suspicious.
light	Acid	CO_2 1 H 5	Acid	CO_2 2 H 1	Not coagulated; heliotrope fifth day	White, elevated, dry	Trace	2
								3 Could not be isolated.
								4
								5
							Slight	6
								7
ctive	Acid	CO_2 1 H 3	Acid	CO_2 1 H 3	Coagulated third day; pink	Slight and dry	Considerable.	8 Intestinal bacillus.
light	do	CO_2 0 H 1	do	CO_2 1 H 2		No apparent growth	None	9
do	do	CO_2 1 H 2	do	CO_2 1 H 2	Coagulated third day; pink	Moist growth	Slight	10 Intestinal bacillus.
ctive	do	CO_2 2 H 1	do	CO_2 2 H 1	Coagulated third day; pink	Yellow, moist, spreading	do	11 Another sample taken later ferments glucose but not lactose.
light	do	CO_2 1 H 3	do	CO_2 H	Coagulated third day; pink	Moist growth, slight	Considerable.	12 Intestinal bacillus.
ctive	do	CO_2 1 H 2	do	CO_2 2 H 1	Coagulated fifth day	Yellowish, elevated, dry	Trace	13 Intestinal bacillus.
light	do	CO_2 1 H 2	do	CO_2 1 H 3	Not coagulated sixth: heliotrope	do	Slight	14
ctive	Alkaline	CO_2 0 H 0	do	CO_2 0 H 0	Not coagulated sixth day; pink	Slight moist growth	do	15 Suspicious.
light	Acid	CO_2 1 H 4	do	CO_2 1 H 4	Coagulated fourth day	Slight moist colorless growth	do	16
do	do	CO_2 1 H 2	do	CO_2 1 H 2	Coagulated third day; pink	Yellowish, elevated, moist, spreading.	Considerable.	17 Intestinal bacillus.
								18
								19
ctive		CO_2 0 H 0		CO_2 0 H 0	Not coagulated sixth day; heliotrope.	Very slight growth	None	20 Suspicious.
light	Acid	CO_2 0 H 0	Acid	CO_2 0 H 1	Coagulated sixth day; heliotrope	do	Slight	21 Suspicious.
ctive	do	CO_2 0 H 0	do	CO_2 0 H 0	Not coagulated sixth day; heliotrope.	White, elevated, moist, spreading.	Trace	22
								23
								24
light	Alkaline	CO_2 0 H 0	Acid	CO_2 0 H 0	Coagulated fourth day; heliotrope	Yellowish, elevated, moist	Slight	25 Suspicious.
								26
								27
light	Alkaline	CO_2 0 H 0	Acid	CO_2 0 H 0	Coagulated fifth day	White, elevated, dry	None	28 Suspicious.
ctive	Acid	CO_2 3 H 1	do	CO_2 2 H 1	Coagulated third day	Yellowish, moist, elevated, spreading.	Trace	29
do	do	CO_2 1 H 4	do	CO_2 1 H 3	Coagulated fourth day	White, yellowish, elevated, moist.	Slight	30
								31
light	Acid	CO_2 0 H 0	Acid	CO_2 2 H 1	Coagulated second day; heliotrope	White, elevated, dry	Considerable.	32 Suspicious. Proteus vulgaris.
								33 Repeated trials failed to isolate the fermenting bacteria.
								34 Suspicious. Same as above.
								35
								36
								37 Suspicious. Fermenting bacteria could not be isolated.
								38
								39
								40
								41 Suspicious. Fermenting bacteria could not be isolated.
ctive	Acid	CO_2 1 H 4	Acid	CO_2 3 H 1	Coagulated third day	Yellowish, moist, spreading	Considerable.	42 Intestinal bacillus.
								43 Intestinal bacillus.
								44
								45
								46 Suspicious. Fermenting bacteria could not be isolated.
								47
								48
								49
ctive	Acid	CO_2 0 H 0	Acid	CO_2 1 H 3	Coagulated second day	Yellowish, moist	None	50 Suspicious. Proteus vulgaris.
do	do	CO_2 1 H 4	do	CO_2 1 H 4	Coagulated sixth day; pink	Yellowish, elevated, moist, spreading.	Considerable.	51
do	do	CO_2 1 H 3	do	CO_2 1 H 3	Coagulated fourth day	Yellow, elevated, spreading	do	52 Intestinal bacillus
light	do	CO_2 1 H 2	do	CO_2 1 H 1	Not coagulated eighth day; pink	Brown, elevated, moist, spreading.	Slight	53
do	do	CO_2 1 H 2	do	CO_2 1 H 1	Not coagulated eighth day; pink	do	do	54
								55
								56
ctive	Acid	CO_2 0 H 0	Acid	CO_2 1 H 3	Coagulated; heliotrope fifth day	Yellow, elevated, moist, spreading.	Considerable.	57 Suspicious. Proteus vulgaris.
								58
light		CO_2 0 H 0		CO_2 0 H 0	Coagulated sixth day	No apparent growth	Slight	59
do		CO_2 0 H 0		CO_2 0 H 0	Coagulated second day	do	Trace	60
ctive	Alkaline	CO_2 1 H 6	Acid	CO_2 1 H 3	Not coagulated eighth day; heliotrope.	Yellowish, moist, spreading	Slight	61 Suspicious.
do	do	CO_2 0 H 0	do	CO_2 0 H 0	Coagulated second day; pink	White, elevated, dry	None	62 Suspicious.
								63
ctive	Acid	CO_2 1 H 3	Acid	CO_2 1 H 3	Coagulated second day; white	Slight, moist, growth	Considerable.	64 Intestinal bacillus.
do					Coagulated second day	Yellowish, moist, spreading	Slight	65
light	Alkaline	CO_2 0 H 0	Acid	CO_2 0 H 0	Coagulated fourth day; heliotrope	White, elevated, dry	Considerable.	66
ctive	Acid	CO_2 1 H 2	do	CO_2 1 H 2	Coagulated third day	White, elevated, moist, spreading.	Slight	67 Intestinal bacillus.
do	do	CO_2 1 H 2	do	CO_2 1 H 2	do	do	Trace	68
								69
								70
								71
						White, elevated, moist, spreading.	Considerable.	72
light	Acid	CO_2 1 H 2	Acid	CO_2 3 H 2	Coagulated second day	Yellowish, moist, spreading	Slight	73 Intestinal bacillus.
								74

*52	Do	Oct. 28, 1895	4,200	do	do	Red colonies	Pale blue, granular, spreading	Does not liquefy	do		
*53	Well, Georgetown University (small boys)	Oct. 15, 1895	Innumerable	do	do	do	Brownish granular, slightly spreading.	do	Slight		
*54	Do	Oct. 25, 1895	2,900	do	do	do	do	do	do		
*55	Well, Georgetown University (large boys)	Oct. 15, 1895	2,700	0	do						
*56	Do	Oct. 25, 1895		0	do						
*57	Well, 132 Central ave., Ivy City	Oct. 15, 1895	15,200	Ferments	do	Red colonies	Brown, granular, spreading	Rapidly liquefies	Active		Aci
*58	Do	Oct. 28, 1895	9,700	0	0						
*59	Well, Miss Ross, Takoma	Oct. 17, 1895	500	0	Ferments	Red colonies	Hyalin, granular, irregular contour, spreading.	Does not liquefy	Slight		
*60	Do	Nov. 11, 1895	11,300	0	do	do	Pale-blue hyalin, spreading	do	do		
61	Spring, Brightwood ave	Oct. 17, 1895	500	Ferments	do	do	Pale hyalin, slightly spreading	do	Active		Alk
*62	Well, near Brightwood ave	do	26,900	do	do	do	Pale hyalin, granular, spreading	do	do		
*63	Well, 411 6½ st. SW	Nov. 20, 18.5		0	0						
*64	Spring, Georgetown University	Oct. 18, 1895	Innumerable	Ferments	Ferments	Red colonies	Small blue, surface colonies, spreading.	Does not liquefy	Active		Aci
65	Do	Oct. 25, 1895	500	do	do	do	Pale-blue hyalin, surface colonies, spreading.	do	do		
66	Well, 23d and M sts	Oct. 21, 1895		do	do	do	Brownish, slightly granular, spreading.	do	Slight		Alk
*67	Well of Judge Miller, Takoma	do	Innumerable	do	do	do	Yellowish, granular, spreading	do	Active		Aci
*68	Do	Nov. 11, 1895	6,350	do	do	do	do	do	do		
69	Well, 1614 Valley st	Oct. 24, 1895	200	0	0						
70	Do	Nov. 2, 1895	1,200	Ferments	0						
*71	Well, Wesley Heights	Oct. 21, 1895	2,900	do	Ferments	Blue colonies					
*72	Do	Nov. 19, 1895		do	do						
*73	Well, H. W. Scannel	Oct. 27, 1895	28,400	do	do	Red colonies	Yellowish, granular, spreading	Does not liquefy	Slight		Aci
*74	Do	Nov. 7, 1895	2,100	do	do	do					
*75	Well, 430 K st. NW	Oct. 27, 1895	15,100	do	0						
*76	Do	Nov. 7, 1895	1,500	do	Ferments	Red colonies	Brownish, granular, spreading	Rapidly liquefies	Slight		Aci
*77	Do	Nov. 19, 1895	400	0	0						
*78	Well, S. M. Lewis, Takoma	Oct. 27, 1895	700	Ferments	Ferments				Active		Aci
*79	Do	Nov. 1, 1895	1,200	do	do	Red colonies	Yellowish, granular, spreading	Does not liquefy	Slight		
*80	Well, 411 6½ st. SW	Oct. 28, 1895	1,600	0	0						
*81	Do	Nov. 9, 1895	20,850	0	0						
*82	Well, Power House, Brightwood	Nov. 1, 1895	1,700	Ferments	Ferments		Yellowish, slightly granular, spreading.	Does not liquefy	Slight		Aci
83	Spring, near Piney Branch	do	3,150	do	do	Red colonies	do	do	do		
*84	Well, 641 Sheridan ave	do		do	do	do	Yellowish, granular, spreading				
*85	Well, Mr. Brice, 739 Sheridan ave	do	3,050	Ferments	do	Red colonies		Does not liquefy	Slight		Aci
86	Well, T st., bet. 17th and 18th NW	Nov. 7, 1895	8,100	0	do						
87	Well, M st., bet. 4½ and 6th sts. SW	Nov. 9, 1895	1,700	0	0						
88	Well, G and 2d sts. NE	Nov. 14, 1895	500	0	0						
89	Do	Sept. 24, 1895	335	0	0						
*90	Artesian well, Palais Royal	Nov. 19, 1895	6,800	0	Ferments						
*91	Columbia lithia water	do		0	do						
*92	Do			Ferments	do	Red colonies		Liquefies	Active		Aci
93	Well, T st., bet. 18th and 19th sts. NW	Nov. 19, 1895									
94	Well, Mr. Hall, Tacoma	Nov. 21, 1895		0	0						
*95	Well, Bunker Hill and 8th st			0	0			Liquefies	Slight		Aci
96	Well, 710 20th st. NE		4,300	Ferments	Ferments	Red colonies	Yellowish, granular, spreading	Does not liquefy	do		
97	Potomac water	Oct. 1, 1895	1,485	do	do	Red colonies	Yellowish iridescent, spreading	do	Active		
98	Do	Oct. 4, 1895	320	do	do	do	Yellowish, slightly granular	Liquefies	do		
99	Do	Oct. 11, 1895	700	do	do	do	Yellowish, coarsely granular	Does not liquefy	Slight		Aci
100	Do	Oct. 17, 1895	3,000	0	do	Red colonies	Pale blue, slightly granular, spreading.	do			
101	Do	Oct. 21, 1895	350	0	do				Active		Aci
102	Do	Oct. 31, 1895	600	0	do			Does not liquefy	Slight		
103	Do	Nov. 1, 1895	1,650	Ferments	do	Red colonies	Yellowish, granular, spreading		do		
104	Do	Nov. 2, 1895	650			do	do	Rapidly liquefying	Active		
105	Do	Nov. 5, 1895	1,700	Ferments	Ferments	do	Brownish, coarsely granular, spreading.	do	do		
106	Do	Nov. 6, 1895	1,500	do	0		Yellowish, granular, irregular	Does not liquefy	Non-motile		
107	Do	Nov. 8, 1895		do	Ferments	Red colonies	Large, slightly granular, spreading	do	Slight		
108	Do	Nov. 13, 1895		do	do	do	do	do	do		
109	Well, Jas. G. Rowe (dairy)	Oct. 22, 1895	1,200	do	do	Red and blue colonies	Pale blue, slightly granular, spreading.	do	do		
110	Spring, Jos. A. Wise (dairy)	Nov. 11, 1895	84,800	do	do	do	Yellowish, granular, spreading	do	do		
111	Well, D. G. Roche (dairy)	do	15,400	do	do	Red colonies	Yellowish, granular coalescing, spreading.	do	do		
112	Well, McMahon (dairy)	Nov. 19, 1895	44,600	do	do	do	Pale blue, slightly granular, spreading.	do	Active		
113	Well, D. A. Wetzel (dairy)	Nov. 20, 1895	6,800	do	do	do	Brownish, granular, coalescing				
114	Well, Geo. T. Knoth (dairy)	do		do	do			Does not liquefy	Slight		Aci
115	Spring, Hygienic Ice Co	Oct. —		do	0		Pale-blue hyalin, spreading				
116	Do	Nov. 21, 1895	240	do	0						
117	Ice, Transparent Ice Co	Nov. 13, 1895		0	0						
118	Do	Dec. 13, 1895		Ferments	Ferments	Red colonies		Gelatine	Slight		Aci
119	Ice, National Capital Ice Co	Nov. 13, 1895		do	0						
120	Do	Dec. 13, 1895		0	0						
121	Ice, Washington Ice Co	Nov. 13, 1895		Ferments	0	Blue and red colonies			Active		Aci
122	Do	Dec. 13, 1895		0	0						
123	Ice, Great Falls Ice Co	Nov. 13, 1895		Ferments	0						
124	Do	Dec. 13, 1895		do	0	Red and blue colonies					
125	Ice, Home Ice Co	Nov. 13, 1895		0	0						
126	Do	Dec. 13, 1895		Ferments	Ferments						
127	Ice, Independent Ice Co	do		do	do	Red and blue colonies	Coarsely granular and spreading	Liquefies	Active		Al

		H 4		H 4			spreading.	able.	
....do....	....do....	CO_2 1	....do....	CO_2 1	Coagulated fourth day	Yellow, elevated, spreading	....do....	52	Intestinal bacillus
		H 3		H 3					
Slight	....do....	CO_2 1	....do....	CO_2 1					
		H 2		H 1	Not coagulated eighth day; pink	Brown, elevated, moist, spreading.	Slight	53	
....do....	....do....	CO_2 1	....do....	CO_2 1					
		H 2		H 1	Not coagulated eighth day; pink	....do....	....do....	54	
								55	
								56	
Active	Acid	CO_2 0	Acid	CO_2 1	Coagulated; heliotrope fifth day	Yellow, elevated, moist, spreading.	Considerable.	57	Suspicious. Proteus vulgaris.
		H 0		H 3					
Slight		CO_2 0		CO_2 0				58	
		H 0		H 0	Coagulated sixth day	No apparent growth	Slight	59	
....do....		CO_2 0		CO_2 0					
		H 0		H 0	Coagulated second day	....do....	Trace	60	
Active	Alkaline	CO_2 1	Acid	CO_2 1					
		H 6		H 3	Not coagulated eighth day; heliotrope.	Yellowish, moist, spreading	Slight	61	Suspicious.
....do....	....do....	CO_2 0	....do....	CO_2 0					
		H 0		H 0	Coagulated second day; pink	White, elevated, dry	None	62	Suspicious.
								63	
Active	Acid	CO_2 1	Acid	CO_2 1	Coagulated second day; white	Slight, moist, growth	Considerable.	64	Intestinal bacillus.
		H 3		H 3					
....do....					Coagulated second day	Yellowish, moist, spreading	Slight	65	
Slight	Alkaline	CO_2 0	Acid	CO_2 0	Coagulated fourth day; heliotrope	White, elevated, dry	Considerable.	66	
		H 0		H 0					
Active	Acid	CO_2 1	....do....	CO_2 1	Coagulated third day	White, elevated, moist, spreading.	Slight	67	Intestinal bacillus.
		H 2		H 2					
....do....	....do....	CO_2 1	....do....	CO_2 1	....do....	....do....	Trace	68	
		H 2		H 2					
								69	
								70	
								71	
						White, elevated, moist, spreading.	Considerable.	72	
Slight	Acid	CO_2 1	Acid	CO_2 3	Coagulated second day	Yellowish, moist, spreading	Slight	73	Intestinal bacillus.
		H 2		H 2					
								74	
								75	
Slight	Acid	CO_2 0	Acid	CO_2 1	Coagulated third day	Yellowish, moist, gas-producing	Considerable.	76	Suspicious. Proteus vulgaris.
		H 0		H 3					
								77	
Active	Acid	CO_2 1	Acid	CO_2 1	Coagulated second day; pink	Yellowish, elevated, moist, spreading.	Considerable.	78	Intestinal bacillus.
		H 3		H 1					
Slight	....do....	CO_2 2	....do....	CO_2 3					
		H 1		H 1			Trace	79	
								80	
							Considerable.	81	
Slight	Acid	CO_2 1	Acid	CO_2 1	Coagulated sixth day	Yellow, elevated, moist	Trace	82	Intestinal bacillus.
		H 2		H 2					
....do....	....do....	CO_2 1	....do....	CO_2 1					
		H 4		H 4	Coagulated third day; pink	Yellow, elevated, moist, spreading.	Slight	83	Intestinal bacillus.
								84	
Slight	Acid	CO_2 1	Acid	CO_2 3					
		H 1		H 1	Not coagulated sixth day; pink	Pale yellow, moist, spreading	Considerable.	85	Suspicious.
								86	
								87	
								88	
								89	
								90	
								91	
Active	Acid	CO_2 2	Acid	CO_2 0	Coagulated milk			92	Suspicious. Sewage bacteria.
		H 1		H 1					
								93	
								94	
Slight	Acid	CO_2 1	Acid	CO_2 1					
		H 4		H 3	Coagulated fourth day	Yellow moist	Considerable.	95	Intestinal bacillus.
....do....	....do....	CO_2 1	....do....	CO_2 1					
		H 3		H 3	Coagulated third day; pink	Yellowish, elevated, moist	....do....	96	Intestinal bacillus.
Active	....do....	CO_2 1	....do....	CO_2 1					
		H 3		H 1	Coagulated third day	Yellowish, elevated, moist, spreading.	Slight	97	Intestinal bacillus.
....do....	....do....	CO_2 0		CO_2 2					
		H 0		H 1	Coagulated fourth day	....do....		98	
Slight	Acid	CO_2 1	Acid	CO_2 1					
		H 2		H 2	Coagulated second day	White, moist, spreading	Considerable.	99	Intestinal bacillus and proteus vulgaris.
								100	
Active	Acid	CO_2 0	Acid	CO_2 3	Coagulated sixth day; yellow	Yellowish, elevated, moist, spreading.	Trace	101	Proteus vulgaris.
		H 0		H 1					
Slight	....do....	CO_2 1	....do....	CO_2 3					
		H 5		H 1			Slight	102	Suspicious.
....do....	....do....	CO_2 1	....do....	CO_2 2					
		H 2		H 1	Coagulated second day	White, elevated, spreading, moist.	Considerable.	103	Suspicious.
Active	....do....	CO_2 1	....do....	CO_2 1					
		H 3		H 3	Coagulated third day	White, slightly moist	....do....	104	Suspicious. Proteus vulgaris.
....do....	....do....	CO_2 4	....do....	CO_2 1					
		H 1		H 5	Coagulated second day	No apparent growth	Slight	105	
Non-motile	....do....	CO_2 0	....do....	CO_2 1					
		H 0		H 4	Coagulated third day	White, elevated, gas-producing	....do....	106	
Slight	....do....	CO_2 1	....do....	CO_2 3					
		H 4		H 1	Coagulated fourth day	Brown, elevated, moist	Considerable.	107	
....do....	....do....	CO_2 1	....do....	CO_2 1					
		H 2		H 2	Coagulated sixth day; pink	Yellowish, elevated, moist	....do....	108	Intestinal bacillus.
....do....	....do....	CO_2 1	....do....	CO_2 1					
		H 2		H 2	Coagulated second day; pink	....do....	....do....	109	Intestinal bacillus.
....do....	....do....	CO_2 1	....do....	CO_2 1					
		H 5		H 3	Coagulated second day	Yellow, moist	Considerable.	110	Intestinal bacillus.
....do....	....do....	CO_2 1	....do....	CO_2 1					
		H 2		H 1	Coagulated third day	Yellowish, moist, spreading	None	111	Intestinal bacillus.
Active	....do....	CO_2 1	....do....	CO_2 1					
		H 3		H 3	Coagulated second day	....do....	Considerable.	112	Intestinal bacillus.
								113	
Slight	Acid	CO_2 1	Acid	CO_2 1	Coagulated third day	Very slight moist growth	Slight	114	Fermenting bacilli could not be isolated.
		H 2		H 2					
								115	
								116	
								117	Suspicious. Fermenting bacteria could not be isolated.
Slight	Acid	CO_2 0	Acid	CO_2 0					
		H 1		H 0				118	
								119	
								120	
Active	Acid	CO_2 1	Acid	CO_2 1					
		H 3		H 1				121	
					Coagulated fourth day	Pale yellow, moist, spreading	Considerable.	122	
								123	
						White, elevated, dry	Slight	124	Suspicious.
								125	
								126	
Active	Alkaline	CO_2 0	Acid	CO_2 2	Coagulated milk third day	Yellow moist		127	Proteus (?).
		H 0		H 1					

water on a former examination. The source of the intestinal and sewage pollution can hardly be a question of doubt, since we know that it must originate from the feces of animals or of man. We are strongly inclined to believe that the origin of the intestinal bacteria was from sewage, because of the smallness of the number to each cubic centimeter, and the absence of other forms which occur when the water is contaminated by washings from the soil. During the time when the first four samples were taken dry weather prevailed and the river was low and the water clear.

In conclusion, we would state that it is our opinion, based upon this and other examinations made during the past four years, that the Potomac water is not at all times free from sewage pollution. No river water receiving as large a quantity of sewage as the Potomac, and this constantly increasing, can ever be above suspicion.

There are two schemes for remedying this condition. One is to own control of the watershed and abate the nuisances. This is not practicable nor feasible. The other is the filtration of the water supply by the system now in successful use in several European cities, among which Hamburg and Zurich may be quoted as examples.

The condition of wells located on dairy farms needs no comment. The results speak for themselves. It is not improbable that if a comprehensive study be made of the water supply of the dairies supplying milk to Washington our knowledge of the relation which the milk supply bears to the prevalence of intestinal and other diseases would be proportionately increased.

The use of surface wells in a city should on general principles be condemned. They are as a rule constantly exposed to contamination, and it appears to be only a question of time when they will be polluted with sewage. Where a better supply can be obtained other than these, it should at once be substituted, and this source of danger removed.

Respectfully submitted,

J. J. KINYOUN,
Passed Assistant Surgeon, M. H. S.
EDO. ANDRADE-PENNY, M. D.,
Assistant.

SUPERVISING SURGEON-GENERAL
UNITED STATES MARINE HOSPITAL.

UNITED STATES.

[Reports to the Supervising Surgeon-General Marine-Hospital Service.]

No New Smallpox Cases in Arizona.

NOGALES, ARIZ., *December 16, 1895.*

SIR: I have the honor to report all the smallpox cases convalescing, and no new cases.

Very respectfully,

W. F. CHENOWETH,
Sanitary Inspector, M. H. S.

[Inclosure.]

BISBEE, ARIZ., *December 11, 1895.*

W. F. CHENOWETH, M. D.:

DEAR DOCTOR: There has been only 1 case of smallpox in or near Bisbee for about two months. That 1 case is now convalescent, is isolated in a pesthouse about half a mile out of town, is in every way properly cared for, and no further spread of the disease is expected.

Respectfully,

FREDERICK ARNOLD SWEET.

Smallpox in Tennessee.

NASHVILLE, *December 18, 1895.*

SIR: I inclose you herewith printed slip giving a statement of the occurrence of smallpox in Tennessee, during the period from November 15 up to and including December 15.

Very respectfully,

J. BERRIEN LINDSLEY, M. D.,
Secretary and Executive Officer.

[Inclosure.]

In Shelby County, from November 15 to December 15, the following cases of smallpox were reported:

Upon November 19 a case of smallpox occurred in the person of a colored man from Pettus Landing, Ark., 50 miles down the river from Memphis.

November 21, a case of confluent smallpox, this case being in the person of a negro man recently arrived from some landing in Mississippi.

November 30, a mild case was discovered in the person of a colored man.

December 3, a colored woman with four children, just arrived from Cow Island, Ark., who occupied a house just outside the city limits. Later 2 additional cases, male and female, colored, were discovered in the same neighborhood.

December 5, 3 cases, colored man and wife, with female child. They contracted the disease at O. K. Landing, Miss. Later, upon December 6, a colored woman and two female children were discovered to have the smallpox. Also 1 other case is reported under date of December 6 in the person of a colored man, discovered 1½ miles south of the city limits of Memphis.

December 9, colored woman, sent from house 1½ miles southeast of the city limits; infected from case recently from O. K. Landing, Miss. A physician upon whom this negro woman had called for treatment also contracted the disease. Also 1 other case—colored child—died of smallpox, the case having been concealed. The father of the child was arrested and prosecuted.

December 10, colored woman; discovered in the vicinity of the city.

December 12, colored male; case discovered in North Chelsea.

December 14, colored male; case discovered 7 miles east of the city.

All of the above cases of smallpox were promptly reported to this office by Dr. F. S. Raymond county health officer of Shelby County.

Upon November 29, Dr. J. J. McGowan, secretary of the city board of health of

Memphis, reported 2 cases of smallpox, discovered in colored man and woman from Southall's plantation, at Marion, Ark.

November 28, 1 case; colored male.

December 2, 1 colored male; origin unknown; also 2 other cases, male and female, colored. These 2 cases contracted from exposure to case reported November 28.

December 3, 1 colored male; case developed at City Hospital.

December 5, 1 colored male.

December 7, 1 colored male. This man came direct from Arkansas City, Ark.

December 9, 1 colored male; disease contracted in Mississippi.

December 11, 3 males and 3 females, all colored; origin unknown.

December 13, 1 white male; also 3 colored males and 1 colored female, from a negro dive adjoining the steamboat landing; whence came those reported on the 11th.

All of the above cases were promptly transferred to the Shelby County Hospital for Communicable Diseases, and the usual precautions of vaccination and disinfection observed.

Upon December 2, Dr. G. A. Lusk, county health officer of Lauderdale County, reported a case of small-pox a short distance below Ashport, in Lauderdale County, in the person of a white man; infected at Luxora, Ark.

December 11 Dr. H. W. Cook, county health officer of Crockett County, reported 2 cases of smallpox at Alamo, in the persons of a colored man and his wife; infection from Arkansas.

Making in all 47 cases in three counties of Tennessee; 44 colored and 3 white. All imported or else originating from imported cases.

*Smallpox in the United States as reported to the Supervising Surgeon-General Marine Hospital Service, August 1 to December 26, 1895.**

Places.	Date.	Cases.	Deaths.	Remarks.
Arkansas:				
Clay County	Aug. 7–Oct. 22	46	14	
Mississippi County	Oct. 12–Dec. 12	75	13	
Arizona:				
Nogales	Aug. 15–Dec. 9	9		
Arivaca	Oct. 24	5		
Illinois:				
Chicago	July 1–July 31		3	
	Aug. 1–Aug. 31		7	
	Sept. 1–Sept. 30		2	
Louisiana:				
New Orleans	July 20–July 27		1	
	Aug. 10–Aug. 31	14	2	
	Sept. 1–Sept. 28	33	2	
	Oct. 5–Nov. 2	25	7	
	Nov. 9–Nov. 30	37	5	
	Dec. 1–Dec. 14	18	5	
Michigan:				
Charleston Township	Aug. 17–Sept. 25	1	1	
Bedford Township	Aug. 24–Oct. 5	1		
Battle Creek Township	July 1–Oct. 18	14	3	
Detroit	To Nov. 30	20	2	
	Nov. 23–Dec. 14	4	1	
Marshall Township	Sept. 16–Sept. 23	1		
Rochester	Oct. 18–Dec. 14	1		
Three Rivers	Nov. 23			Smallpox reported.
Park Township	Dec. 14			Do.
Hamtranck Township	Oct. 23	1		
Missouri:				
Charleston	Nov. 28			Do.
St. Louis	July 20–July 27	1		
Nevada:				
Carson	Sept. 15–Sept. 18	15		
New York:				
Brooklyn	July 27–Aug. 3	1		
	Aug. 10–Aug. 17	1		
	Aug. 24–Aug. 31	1		
New York	Oct. 5–Oct. 12	1		
	Oct. 19–Oct. 26	1		
Ohio:				
Bridgeport and vicinity	Dec. 14	18		
East Liverpool	Dec. 14	1		
Martins Ferry	Dec. 14	22		
Pennsylvania:				
Philadelphia	July 17–Aug. 24	19	3	
	Aug. 16–Oct. 1	7	3	

*For smallpox cases and deaths reported to the Marine-Hospital Service, January 1 to July 31 1895, see Nos. 13, 22, and 31, Vol. X.

Smallpox in the United States as reported to the Supervising Surgeon-General Marine-Hospital Service, August 1 to December 26, 1895—Continued.

Places.	Date.	Cases.	Deaths.	Remarks.
Pennsylvania—*Continued.*				
Philadelphia	Oct. 1–Dec. 12	2		
Knoxville (near Pittsburg)	Dec. 16	1		
Tennessee:				
Ashport	Dec. 2	1		
Alamo	do	2		
Crittenden County	Nov. 13	1		
Cow Island	July 15–Sept. 15	33		
Memphis	Aug. 1–Sept. 15	4		
	Sept. 15–Oct. 15	4		
	Dec. 1–Dec. 14	35		
Ensley plantation:				
Shelby County	Sept. 15–Oct. 23	4		
	Nov. 15–Dec. 15	15		
Texas:				
Eagle Pass	July 29–Sept. 22	178	51	
Virginia:				
Patrick Springs	Aug. 3	21	3	
Wisconsin:				
Dayton	Sept. 13	1		
West Virginia:				
Wheeling	Sept. 16–Sept. 28	28	3	
	Dec. 16	2		

Report of Immigration at Boston for the Week ended December 21, 1895.

OFFICE OF U. S. COMMISSIONER OF IMMIGRATION,
Port of Boston, December 21, 1895.

Number of Alien Immigrants who Arrived at this Port during the Week ended December 21, 1895; also Names of Vessels and Ports from which they Arrived.

Date.	Vessel.	Where from.	No. of immigrants from Russia.	No. of immigrants.
1895.				
Dec. 16	Steamship Boston	Yarmouth, Nova Scotia		68
Do.	Steamship Cephalonia	Liverpool and Queenstown	71	231
Do.	Schooner B. M. Thornburn	Shelburne Falls, Nova Scotia		1
Dec. 18	Schooner Dominion	Liverpool, Nova Scotia		1
Dec. 19	Steamship Boston	Yarmouth, Nova Scotia		67
Do.	Steamship Halifax	Halifax, Nova Scotia		28
Dec. 20	Steamship Hibernian	Glasgow, Scotland		16
Do.	Steamship Armenian	Liverpool, England		3
Dec. 21	Steamship Belgian King	Antwerp		4
	Total		71	419

THOMAS F. DELHANTY,
Commissioner of Immigration.

Report of Immigration at New York for the Week ended December 21, 1895.

OFFICE OF U. S. COMMISSIONER OF IMMIGRATION,
Port of New York, December 23, 1895.

Number of Alien Immigrants who Arrived at this Port during the Week ended December 21, 1895; also Names of Vessels and Ports from which they Arrived.

Date.	Vessel.	Where from.	No. of immigrants from Russia.	No. of immigrants.
1895.				
Dec. 16	Steamship Albano	Hamburg	72	280
Do.	Steamship Hekla	Copenhagen, etc.		146
Do.	Steamship Scotia	Hamburg	94	251
Dec. 17	Steamship La Champagne	Havre		274
Do.	Steamship Veendam	Rotterdam	23	249
Dec. 18	Steamship Pomeranian	Glasgow	33	93
Do.	Steamship Friesland	Antwerp	1	117
Dec. 19	Steamship Anchoria	Glasgow	97	190
Do.	Steamship Fulda	Genoa, Naples, etc.		392
Do.	Steamship Havel	Bremen	1	290
Dec. 20	Steamship Alsatia	Naples, Palermo, etc.		361
Do.	Steamship Moravia	Hamburg	209	346
Dec. 21	Steamship Normannia	do.	4	95
Do.	Steamship Patria	Naples		585
Do.	Steamship Paris	Southampton	11	171
	Total		545	3,840

DR. J. H. SENNER,
Commissioner of Immigration.

Report of Immigration at Philadelphia for the Week ended December 21, 1895.

OFFICE OF U. S. COMMISSIONER OF IMMIGRATION,
Port of Philadelphia, December 23, 1895.

Number of Alien Immigrants who Arrived at this Port during the Week ended December 21, 1895; also Names of Vessels and Ports from which they Arrived.

Date.	Vessel.	Where from.	No. of immigrants from Russia.	No. of immigrants.
1895.				
Dec. 17	Steamship Belgenland	Liverpool and Queenstown	44	112
Dec. 21	Steamship Pennsylvania	Antwerp		264
	Total		44	376

JNO. J. S. RODGERS,
Commissioner of Immigration.

Vessels Arriving at, Departing from, and Remaining at United States Quarantine Stations.

DELAWARE BREAKWATER QUARANTINE.

Week ended December 22, 1895.

Five vessel inspected and passed.

PORT TOWNSEND QUARANTINE.

Week ended December 7, 1895.

Two vessels inspected and passed.

SAN DIEGO QUARANTINE.

Week ended December 18, 1895.

One vessel inspected and passed.

SOUTH ATLANTIC QUARANTINE.

Week ended December 14, 1895.

One vessel inspected and passed.

Reports of States and Yearly and Monthly Reports of Cities.

CALIFORNIA.—Month of November, 1895. Reports to the state board of health from 58 cities, towns, and villages having an aggregate population of 744,579, show a total of 1,000 deaths, including phthisis pulmonalis, 171; enteric fever, 17; diphtheria, 6; croup, 3; and whooping cough, 2.

CONNECTICUT—*Hartford.*—Month of November, 1895. Estimated population, 62,000. Total deaths, 76, including enteric fever, 7; and diphtheria, 3.

New Haven.—Month of October, 1895. Estimated population, 100,000. Total deaths, 164, including phthisis pulmonalis, 20; enteric fever, 4; diphtheria and croup, 3; and whooping cough, 3.

Month of November, 1895. Total deaths, 124, including phthisis pulmonalis, 12; diphtheria and croup, 6; and enteric fever, 4.

INDIANA—*Evansville.*—Month of October, 1895. Estimated population, 60,000. Total deaths, 118, including phthisis pulmonalis, 13; enteric fever, 11; scarlet fever, 2; and whooping cough, 1.

Month of November, 1895. Total deaths, 90, including phthisis pulmonalis, 9; enteric fever, 2; diphtheria, 3; croup, 1; and whooping cough, 1.

IOWA—*Council Bluffs.*—Month of November, 1895. Estimated population, 20,189. Total deaths, 26, including diphtheria, 8; and phthisis pulmonalis, 2.

Creston.—Month of November, 1895. Estimated population, 6,300. Total deaths, 7. No deaths from contagious diseases.

Davenport.—Month of November, 1895. Estimated population, 30,100. Total deaths, 54, including phthisis pulmonalis, 4.

Des Moines.—Month of November, 1895. Estimated population, 82,000. Total deaths, 51, including phthisis pulmonalis, 4; enteric fever, 8; and diphtheria, 3.

Dubuque.—Month of November, 1895. Estimated population, 40,000. Total deaths, 29, including phthisis pulmonalis, 4; enteric fever, 2; and diphtheria, 4.

Eddyville.—Month of November, 1895. Estimated population, 1,000. No deaths.

Decorah.—Month of November, 1895. Estimated population, 3,141. Five deaths, including enteric fever, 1.

Keokuk.—Month of November, 1895. Estimated population, 14,287.

Total deaths, 11, including 1 from phthisis pulmonalis; and 1 from enteric fever.

Oskaloosa.—Month of November, 1895. Estimated population, 8,551. Total deaths, 5. No deaths from contagious diseases.

MARYLAND—*Baltimore.*—Month of November, 1895. Estimated population, white, 422,568; colored, 73,747; total, 496,315. Deaths, white, 583; colored, 158; total, 741, including phthisis pulmonalis, 93; enteric fever, 19; scarlet fever, 1; diphtheria, 38; and croup, 9.

MASSACHUSETTS—*Northampton.*—Month of November, 1895. Estimated population, 16,400. Total deaths, 14, including phthisis pulmonalis, 2, and whooping cough, 1.

MICHIGAN.—Week ended December 14, 1895. Reports to the State board of health from 49 observers indicate that erysipelas, remittent fever, pneumonia, and inflammation of kidney increased and consumption and scarlet fever decreased in area of prevalence. Phthisis pulmonalis was reported present during the week at 186 places, enteric fever at 52, scarlet fever at 31, diphtheria at 28, whooping cough at 7, and smallpox at 3 places—Detroit, Park Township, and Rochester.

MISSOURI—*Kansas City.*—Month of November, 1895. Estimated population, 150,000. Total deaths, 148, including phthisis pulmonalis, 8; enteric fever, 1; diphtheria, 9; and croup, 8.

NEW JERSEY—*Hudson County.*—Month of November, 1895. Estimated population, 318,746. Total deaths, 424, including phthisis pulmonalis, 57; enteric fever, 10; scarlet fever, 3; diphtheria, 32; and whooping cough, 1.

OHIO—*Columbus.*—Month of November, 1895. Estimated population, 100,000. Total deaths, 119, including phthisis pulmonalis, 11; enteric fever, 8; scarlet fever, 1; and diphtheria, 20.

PENNSYLVANIA—*Plymouth.*—Month of November, 1895. Estimated population, 14,000. Total deaths, 10, including enteric fever, 2, and diphtheria, 2.

Pottsville.—Two weeks ended December 17, 1895. Estimated population, 14,000. Total deaths, 6. No deaths from contagious diseases.

UTAH—*Salt Lake City.*—Month of November, 1895. Estimated population, 70,000. Total deaths, 50, including phthisis pulmonalis, 2; enteric fever, 4; and diphtheria, 2.

MORTALITY TABLE, CITIES OF THE UNITED STATES.

Cities.	Week ended.	Population, U. S. Census of 1890.	Total deaths from all causes.	Deaths from—										
				Phthisis pulmonalis.	Yellow fever.	Smallpox.	Varioloid.	Cholera.	Typhus fever.	Enteric fever.	Scarlet fever.	Diphtheria.	Measles.	Whooping cough.
Alameda, Cal	Dec. 7	11,165	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Do	Dec. 14	11,165	7	3	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
Allegheny, Pa	Nov. 23	105,287	53	.....	.....	.....	.....	.....	.....	17	½	1	.....	.....
Do	Nov. 30	105,287	57	.....	.....	.....	.....	.....	.....	21	.....	2	.....	.....
Do	Dec. 7	105,287	73	.....	.....	.....	.....	.....	.....	18	.....	1	.....	2
Do	Dec. 14	105,287	68	.....	.....	.....	.....	.....	.....	9	.....	6	.....	3
Ashtabula, Ohio	Dec. 21	8,338	8	1	.....	.....	.....	.....	.....	.....	.....	4	.....	.....
Auburn, N. Y	Dec. 14	25,858	7	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Baltimore, Md	Dec. 21	434,439	228	35	.....	.....	.....	.....	.....	5	6	8	4	.....
Belleville, Ill	Dec. 14	15,361	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Dec. 21	15,361	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bennington, Vt	do	6,391	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Binghamton, N. Y	do	35,005	13	1	.....	.....	.....	.....	.....	1	.....	1	.....	.....
Boston, Mass	do	448,477	240	32	.....	.....	.....	.....	.....	6	1	17	.....	.....
Bristol, Conn	Dec. 14	7,382	6	1	.....	.....	.....	.....	.....	.....	.....	2	.....	.....
Do	Dec. 21	7,382	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bristol, R. I	Dec. 14	5,478	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Dec. 21	5,478	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brockton, Mass	Dec. 14	27,294	7	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Brooklyn, N. Y	Dec. 21	806,343	451	47	.....	.....	.....	.....	.....	3	4	48	2	4
Butler, Pa	do	8,734	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cambridge, Mass	do	70,028	35	3	.....	.....	.....	.....	.....	.....	.....	4	.....	.....
Carlisle, Pa	do	7,620	2	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Charleston, S. C	Dec. 14	*54,955	†23	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cincinnati, Ohio	Dec. 20	296,908	158	23	.....	.....	.....	.....	.....	6	.....	11	3	2
Cleveland, Ohio	Dec. 21	261,353	87	5	.....	.....	.....	.....	.....	2	.....	4	.....	.....
Columbus, Ind	Dec. 14	6,719	2	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Do	Dec. 21	6,719	4	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....
Columbus, Ohio	do	88,150	40	7	.....	.....	.....	.....	.....	3	1	3	.....	.....
Council Bluffs, Iowa	Dec. 14	21,474	3	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....
Do	Dec. 21	21,474	3	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Dayton, Ohio	Dec. 19	61,220	24	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dedham, Mass	Dec. 7	7,123	5	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Dec. 14	7,123	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Detroit, Mich	Dec. 21	205,876	.....	8	.....	.....	.....	.....	.....	.....	1	7	.....	.....
Elizabeth City, N. J	do	37,764	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Everett, Mass	do	11,068	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fall River, Mass	do	74,398	34	.....	.....	.....	.....	.....	.....	1	2	1	.....	.....
Fitchburg, Mass	Dec. 14	22,037	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Dec. 21	22,037	7	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
Flint, Mich	do	9,803	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fort Worth, Tex	Dec. 14	23,076	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gloucester, Mass	do	24,651	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grand Rapids, Mich	Dec. 21	60,278	11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Green Bay, Wis	Dec. 14	9,069	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Dec. 21	9,069	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Haverhill, Mass	do	27,412	15	1	.....	.....	.....	.....	.....	2	.....	.....	1	.....
Hoboken, N. J	Dec. 14	43,648	17	.....	.....	.....	.....	.....	.....	.....	.....	4	.....	.....
Ironton, Mich	Dec. 21	10,939	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jamestown, N. Y	Dec. 14	16,038	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jersey City, N. J	Dec. 15	163,003	73	8	.....	.....	.....	.....	.....	1	1	5	.....	.....
Johnstown, Pa	Dec. 21	21,805	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kalamazoo, Mich	Dec. 14	17,853	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Dec. 21	17,853	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lawrence, Mass	Dec. 14	44,654	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lebanon, Pa	do	14,664	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lowell, Mass	Dec. 21	77,696	37	5	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Ludington, Mich	do	7,517	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lynchburg, Va	do	19,709	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
McKeesport, Pa	Dec. 14	20,741	9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Dec. 21	20,741	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Macon, Ga	Dec. 14	22,746	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Dec. 21	22,746	6	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Manchester, N. H	Dec. 14	44,126	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Dec. 21	44,126	17	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
Marinette, Wis	do	11,523	3	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Massillon, Ohio	do	10,092	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Medford, Mass	do	11,079	4	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Memphis, Tenn	do	64,495	33	4	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Michigan City, Ind	Dec. 14	10,776	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Dec. 21	10,776	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Middletown, Ohio	Dec. 14	7,681	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Dec. 21	7,681	0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

*Estimated population, white, 28,870; colored, 36,295; total, 65,165. †White, 14; colored, 9.

MORTALITY TABLE, CITIES OF THE UNITED STATES—Continued.

Cities.	Week ended.	Population, U. S. Census of 1890.	Total deaths from all causes.	Deaths from—									
				Phthisis pulmonalis.	Yellow fever.	Smallpox.	Varioloid.	Cholera.	Typhus fever.	Enteric fever.	Scarlet fever.	Diphtheria.	Measles.	Whooping cough.
Milford, Mass	Dec. 23	8,780	3	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Minneapolis, Minn	Dec. 14	164,738	48	2	.....	.....	.....	.....	.....	.....	.....	.....	1	1
Milwaukee, Wis	Dec. 21	204,468	72	3	.....	.....	.....	.....	.....	1	.....	4	.....	.....
Nashville, Tenn	do	76,168	29	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Naugatuck, Conn	do	6,218	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
New Bedford, Mass	do	40,733	25	3	.....	.....	.....	.....	.....	.....	.....	2	.....	.....
New Haven, Conn	Dec. 19	81,298	25	5	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
New Orleans, La	Dec. 14	242,039	162	17	.....	2	.....	.....	.....	1	.....	1	.....	.....
Do	Dec. 21	242,039	158	6	.....	.....	.....	.....	.....	4	.....	2	.....	1
Newport, R. I	do	19,457	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Newton, Mass	do	24,379	7	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New York, N. Y	Dec. 20	1,515,301	797	100	.....	.....	.....	.....	.....	13	6	37	22	9
Norristown, Pa	Dec. 21	19,791	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Northampton, Mass	Dec. 14	14,990	4	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
North Attleboro, Mass	do	6,727	0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Dec. 21	6,727	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Olean, N. Y	do	7,358	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Omaha, Nebr	do	140,452	16	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
Oneonta, N. Y	do	6,272	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ottumwa, Iowa	do	14,001	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Paris, Tex	do	8,254	0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pensacola, Fla	Dec. 14	11,750	5	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
Do	Dec. 21	11,750	4	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
Philadelphia, Pa	Dec. 14	1,046,964	390	36	.....	.....	.....	.....	.....	12	1	26	2	3
Pittsburg, Pa	do	238,617	82	4	.....	.....	.....	.....	.....	2	3	1	2	.....
Do	Dec. 21	238,617	97	7	.....	.....	.....	.....	.....	6	4	1	7	1
Pittsfield, Mass	Dec. 14	17,281	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Dec. 21	17,281	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portland, Me	Dec. 21	36,425	13	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Poughkeepsie, N. Y	do	22,206	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Providence, R. I	do	132,146	67	9	.....	.....	.....	.....	.....	4	.....	2	.....	.....
Pueblo, Colo	Dec. 14	24,558	11	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Reading, Pa	Dec. 23	58,661	26	2	.....	.....	.....	.....	.....	2	.....	.....	.....	.....
Richmond, Va	Dec. 14	81,388	30	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Dec. 21	81,388	22	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Salt Lake City, Utah	Dec. 14	44,843	2	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
San Diego, Cal	do	16,159	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Francisco, Cal	do	298,997	124	19	.....	.....	.....	.....	.....	3	.....	.....	.....	.....
Santa Barbara, Cal	do	5,864	0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Scranton, Pa	Dec. 21	75,215	26	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Seattle, Wash	Dec. 14	42,837	7	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Shreveport, La	Dec. 21	11,979	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Sioux Falls, S. Dak	Dec. 14	10,177	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Somerville, Mass	Dec. 21	40,152	17	2	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Spokane, Wash	Dec. 14	19,922	3	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Springfield, Mass	Dec. 21	44,179	15	1	.....	.....	.....	.....	.....	.....	.....	2	.....	.....
Sterling, Ill	Dec. 14	5,824	0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Dec. 21	5,824	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Superior, Wis	Dec. 14	11,983	8	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1
Do	Dec. 21	11,983	6	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	3
Taunton, Mass	do	25,448	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tiffin, Ohio	do	10,801	3	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Urbana, Ohio	do	6,510	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
Utica, N. Y	Dec. 4	44,007	16	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Waltham, Mass	Dec. 21	18,707	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Warren, Ohio	do	5,973	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washington, D. C	Dec. 14	230,392	110	9	.....	.....	.....	.....	.....	6	1	3	.....	.....
Do	Dec. 21	230,392	103	15	.....	.....	.....	.....	.....	8	1	2	.....	.....
West Bay City, Mich	do	12,981	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wilmington, Del	do	61,431	26	3	.....	.....	.....	.....	.....	1	.....	.....	.....	1
Winona, Minn	Dec. 14	18,208	7	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Worcester, Mass	Dec. 13	84,655	32	8	.....	.....	.....	.....	.....	1	.....	2	.....	.....
Do	Dec. 20	84,655	32	2	.....	.....	.....	.....	.....	2	.....	3	.....	.....
Yonkers, N. Y	do	32,033	14	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown, Ohio	Dec. 21	33,220	10	1	.....	.....	.....	.....	.....	.....	2	.....	.....	.....

Table of Temperature and Rainfall, Week ended December 16, 1895.

[Received from Department of Agriculture, Weather Bureau.]

Locality.	Temperature in degrees Fahrenheit.			Rainfall in inches and hundredths.		
	Normal.	*Excess.	*Defic'ncy.	Normal.	Excess.	Deficiency.
Atlantic Coast:						
Eastport, Me	28		10	.98		.98
Portland, Me	24		8	.77		.77
Northfield, Vt	22		12	.66		.65
Boston, Mass	33		11	.73		.72
Vineyard Haven, Mass	39		8	.75		.68
Nantucket, Mass	35		3	.77		.63
Woods Holl, Mass	36		7	.68		.28
Block Island, R. I	38		11	.90		.90
New Haven, Conn	33		8	.78		.78
Albany, N. Y	31		14	.63		.63
New York, N. Y	36		9	.70		.70
Harrisburg, Pa	36		9	.70		.68
Philadelphia, Pa	37		9	.58		.58
Atlantic City, N. J	37		8	.85		.80
Baltimore, Md	39		9	.70		.68
Washington, D. C	38		10	.66		.55
Lynchburg, Va	41		9	.77		.76
Cape Henry, Va	45		10	.84	1.70	
Norfolk, Va	45		10	.84	.25	
Charlotte, N. C	45		9	1.05		.85
Raleigh, N. C	43		10	.60	.25	
Kittyhawk, N. C	47		9	.98	.30	
Hatteras, N. C	49			1.33		
Wilmington, N. C	50		11	.77		.24
Columbia, S. C	48		7	.70	.34	
Charleston, S. C	53		8	.83	.19	
Augusta, Ga	50		7	.84		.08
Savannah, Ga	54		8	.79		.16
Jacksonville, Fla	58		10	.70		.28
Jupiter, Fla	67		11	.41		.21
Key West, Fla	70		7	.42		.32
Gulf States:						
Atlanta, Ga	46		6	1.42		.96
Tampa, Fla	63		10	.56	.11	
Pensacola, Fla	55		9	1.05		1.05
Mobile, Ala	53		6	1.01		1.01
Montgomery, Ala	51		7	1.12		1.12
Meridian, Miss	51		6	1.12		1.12
Vicksburg, Miss	52		3	1.19		1.19
New Orleans, La	57		6	1.05		1.05
Shreveport, La	51		1	1.12		1.11
Fort Smith, Ark	44	0		.70		.39
Little Rock, Ark	46		2	.94		.79
Palestine, Tex	52	0		.77		.77
Galveston, Tex	59		3	1.05		1.02
San Antonio, Tex	55	2		.42		.42
Corpus Christi, Tex	59		1	.37		.37
Ohio Valley and Tennessee:						
Memphis, Tenn	45		3	.79		.65
Nashville, Tenn	43		4	.72		.69
Chattanooga, Tenn	44		4	.96		.94
Knoxville, Tenn	41		4	.91		.66
Louisville, Ky	40		5	.86		.80
Indianapolis, Ind	34		3	.77		.72
Cincinnati, Ohio	38		6	.77		.73
Columbus, Ohio	35		8	.70		.49
Parkersburg, W. Va	37		8	.77		.58
Pittsburg, Pa	36		9	.63		.45
Lake Region:						
Oswego, N. Y	30		10	.77		.77
Rochester, N. Y	30		6	.63		.54
Buffalo, N. Y	31		6	.77		.76
Erie, Pa	34		10	.77		.71
Cleveland, Ohio	32		8	.63		.33
Sandusky, Ohio	33		7	.63		.07
Toledo, Ohio	32		8	.56	.13	
Detroit, Mich	32		9	.63		.05
Lansing, Mich	29		9	.42		.25
Port Huron, Mich	29		7	.56		.53
Alpena, Mich	26		4	.56		.19
Sault Ste. Marie, Mich	23		1	.49		.30
Marquette, Mich	24	3		.52		.16
Green Bay, Wis	24	3		.63		.29

*The figures in these columns represent the average daily departure.

Table of Temperature and Rainfall, Week ended December 16, 1895—Continued.

Locality.	Temperature in degrees Fahrenheit.			Rainfall in inches and hundredths.		
	Normal.	*Excess.	*Defic'ncy.	Normal.	Excess.	Deficiency.
Lake Region—*Continued.*						
Grand Haven, Mich.	31		4	.63		.54
Milwaukee, Wis.	28	1		.49		.41
Chicago, Ill.	31		2	.55		.52
Duluth, Minn.	19	10		.29	.21	
Upper Mississippi Valley:						
St. Paul, Minn.	20	10		.28		.23
La Crosse, Wis.	25	7		.31		.26
Dubuque, Iowa	27	6		.42		.42
Davenport, Iowa	29	4		.42		.36
Des Moines, Iowa	27	10		.35		.35
Keokuk, Iowa	31	6		.49		.49
Springfield, Ill.	34	0		.63		.61
Cairo, Ill.	40	3		.74		.50
St. Louis, Mo	38	0		.56		.52
Missouri Valley:						
Columbia, Mo.	39	0		.17		.17
Springfield, Mo.	38	3		.55		.55
Kansas City, Mo.	34	7		.33		.33
Wichita, Kans	35	9		.15		.15
Concordia, Kans.	34	7		.17		.17
Omaha, Nebr.	28	11		.21		.21
Yankton, S. Dak.	25	11		.21		.21
Valentine, Nebr.	26	12		.14		.14
Huron, S. Dak.	19	15		.21		.21
Pierre, S. Dak.	22	16		.10		.10
Moorhead, Minn.	12	15		.18		.18
St. Vincent, Minn.	8	18		.14	.02	
Bismarck, N. Dak.	15	18		.16		.16
Williston, N. Dak.	14	15		.14		.13
Rocky Mountain Region:						
Havre, Mont.	20	16		.14		.06
Helena, Mont.	25	8		.21	.18	
Miles City, Mont	20	14		.07	.19	
Rapid City, S. Dak.	33			.01		
Spokane, Wash.	32			.63		
Wallawalla, Wash.	40			.60		
Baker City, Oreg.	29			.42		
Winnemucca, Nev.	32	0		.28		.23
Salt Lake City, Utah	35		7	.35		.23
Lander, Wyo.	23	3		.14		.14
Cheyenne, Wyo.	30	7		.05		.05
North Platte, Nebr	29	9		.17		.17
Denver, Colo.	35	9		.14		.14
Pueblo, Colo.	35	2		.07	.11	
Dodge City, Kans.	34	9		.14		.14
Oklahoma City, Okla.	43	1		.59		.59
Abilene, Tex.	48	3		.28		.28
Santa Fe, N. Mex.	33	4		.17		.08
El Paso, Tex.	47	0		.14		.14
Phœnix, Ariz.	54	2		.24		.22
Pacific Coast:						
Tatoosh Island, Wash.	44			3.08		
Port Angeles, Wash.	39	3		1.20	.92	
Fort Canby, Wash.	44	1		2.57		.21
Astoria, Oreg.	45	1		2.50	.21	
Portland, Oreg.	42	2		1.93		.08
Roseburg, Oreg.	43	2		1.47	1.03	
Eureka, Cal.	49			1.82		
Red Bluff, Cal.	48		5	1.23		.59
Carson City, Nev.	36	1		.65	0	
Sacramento, Cal.	49		5	.98		.64
San Francisco, Cal.	52		4	1.19		1.04
Fresno, Cal.	47		6	.35	.04	
Independence, Cal.	40			.53		
Los Angeles, Cal.	56	5		1.10		.77
San Diego, Cal.	56	3		.56		.44
Yuma, Ariz.	58	3		.14		.14

* The figures in these columns represent the average daily departure.

FOREIGN.

[Reports received from the United States consuls through the Department of State and from other sources.]

Cholera and Yellow Fever as reported to the Supervising Surgeon-General Marine-Hospital Service, January 4 to December 26, 1895.

CHOLERA.

Places.	Date.	Cases.	Deaths.	Remarks.
Arabia	Mar. 23-June 21	102	471	
Argentina	Jan. 1-Mar. 29	263	143	
Austria-Hungary	Aug. 23-Nov. 18	351	226	
Brazil	Dec. 1-May 18	220	233	
Ceylon	Jan. 26-Feb. 2	8	8	
China	Apr. 30-Sept. 21	.....	.....	Cholera reported.
Egypt*	Oct. 22-Nov. 27	602	514	
France	Aug. 11-Nov. 2	.....	54	
Hawaiian Islands	Aug. 18-Oct. 3	88	63	
India	Dec. 7-Nov. 12	.....	2,139	
Japan	To Nov. 14	56,367	39,721	
Korea	June 30-July 13	.....	.....	Do.
Morocco	Sept. 1-Nov. 12	3,886	2,114	
Russia	Nov. 4, '94-Nov. 9, '95.	27,172	10,627	
Turkey	Dec. 11, '94-Oct. 19, '95.	6,833	3,930	

YELLOW FEVER.

Brazil	Nov. 23, '94-Nov. 9, '95.	651	1,111	
Cuba	Dec. 20, '94-Dec. 8, '95.	1,770	1,347	
Ecuador	Jan. 24-Nov. 8	14	11	
Mexico	Dec. 27, '94-Nov. 28, '95.	.....	137	
Salvador	Dec. 9, '94-Nov. 1, '95.	.....	12	
Puerto Rico	Nov. 21, '94-Nov. 29, '95.	319	148	
Venezuela	Feb. 2-June 15	.....	2	
West Indies	Dec. 28, '94-Oct. 26, '95.	6	6	

*The exact number of cholera deaths and cases throughout Egypt during the outbreak is not known. From October 11 to November 15 there have been approximately 759 cases and about 604 deaths.

Cholera Notes.

[Translated in this Bureau from the "Veröffentlichungen des Kaiserlichen Gesundheitsamtes," Berlin, December 4, 1895.]

Austria-Hungary—Galicia.—From November 19 to 25, 28 cases and 11 deaths were reported. Of these, 5 cases, 2 deaths occurred in 3 communes of the district of Trembowla, 4 cases and 3 deaths in 3 communes of the district of Czurtkow; in 2 localities of the district of Husiatyn, 6 cases, 1 death; and in the district of Kamionka Strumilowa, 8 cases, 4 deaths, respectively; in 1 locality each of the districts of Borszczow, 1 case; Buczacz, 1 case; and Jaroslaw, 1 case, 1 death, respectively. Since August 23 the total number of cases and deaths, in 51 localities of 14 districts of Galicia, is 379 and 245, respectively.

Russia.—From November 16 to 20, 24 cases of "choleraic affection" occurred in the hospital of St. Petersburg. Of these, 10 cases were fatal.

Egypt.—Advices of November 22 give the following statement of cases and deaths. Damietta, from November 7 to 19, 25 cases, 20 deaths; Ezbet el Borg, during the same period, 27 cases, 19 deaths; Ahmadieh, from November 6 to 16, 25 cases, 22 deaths; Bigalat, from November 4 to 13, 7 cases, 7 deaths; Kolonghil, from November 6 to 9, 1 case, 1 death; El Daraksa, from November 7 to 14, 2 cases, 1 death; Ezbet Khalafala Pacha, from November 7 to 13, 5 cases, 2 deaths; Salamoun, from November 8 to 14, 8 cases, 7 deaths; Faraskony, from November 14 to 18, 3 cases, 2 deaths; Menzaleh, from November 4 to 16, 35 cases, 41 deaths; Metarieh, near Menzaleh, 19 cases, 18 deaths; from November 4 to 11, in el Kurdi, 7 cases, 7 deaths; in Bousrate, from November 4 to 14, 33 cases, 32 deaths; at Czarka, from November 15 to 18, 2 cases, 3 deaths, and at Kafr el Jouar, from November 16 to 18, 3 cases, 2 deaths.

Current Quarantine Measures.

[Translated in this Bureau from the "Veröffentlichungen des Kaiserlichen Gesundheitsamtes," Berlin, November 27, 1895.]

CHOLERA.

Roumania.—Advices of November 14 state that the Government has resolved to forbid the importation and transportation of unwashed bed clothing, mattresses, and personal clothing arriving from Russia, Galicia, Turkey, or Egypt.

Denmark.—The ministry of justice has, under date of November 21, directed that the regulations of July 2, 1880, in regard to sanitary police inspection of vessels be put in force for all arrivals from the port of St. Petersburg. The provisions of the proclamation of September 9, 1893, with regard to medical inspection of all persons arriving by vessel at Danish ports were put in force on the same date, and the transportation of all articles of clothing, bed clothing, and linen not belonging to passenger or freight trains, if such articles have been in personal use, is forbidden.

Sweden.—By proclamation of the board of commerce of November 20 the city and government of St. Petersburg are declared infected since the 6th of November. The same proclamation also provides that, in addition to the inspection and quarantine measures now applied at the quarantine stations of Kamro, in the Strait of Gothenburg, and Fejan, in the Stockholm Strait, similar measures be put in force at the inspection stations of Bredvik, near Umeå; Jemiskaren, near Lundsvall; Harön, in the Strait of Stockholm; Arkö, in the Strait of East Gothland; and Vestra Hästholmen, in the Strait of Karlskrona.

Spain.—A royal proclamation of November 22 orders quarantine for all arrivals from St. Petersburg. The same proclamation also declares all ports situated not more than 165 kilometers in a direct line from St. Petersburg to be suspect.

Portugal.—By ministerial proclamation of November 23 the ports of the Sandwich Islands are declared clean from the 10th of November.

Hawaii.—Vessels leaving Honolulu on and after October 18 have been given clean bills of health.

Yellow Fever.

Portugal.—Advices of November 21 state that the port of Brazil is officially declared infected, and other ports of Brazil are declared "suspect."

BRAZIL.

Sanitary Reports of Rio de Janeiro.

RIO DE JANEIRO, *November 19, 1895.*

SIR: I have the honor to transmit report for the week ended November 16, 1895:

There were 6 deaths from accesso pernicioso, a decrease of 4; 7 from yellow fever, a decrease of 4; 58 from smallpox, an increase of 12; 2 from enteric fever, a decrease of 5; 2 from measles, an increase of 1; 46 from tuberculosis, a decrease of 12; and 1 from whooping cough, and none from cholerina. From all causes there were 345 deaths, a decrease of 3.

On the whole, I think the report shows better, except for smallpox.

Yellow fever.—In spite of the very high temperature the deaths from this cause have diminished, as well as from accesso pernicioso.

Smallpox.—This disease does not appear to be getting more rife, although the number of deaths have augmented even with the hot weather. In Victoria it is rapidly diminishing according to telegrams received yesterday, and at the other infected points there is no increase.

Since last report the following-named ships have been visited and received bills of health from this office

November 13, barkentine *Doris*, American, for Baltimore, Md.; November 15, steamship *Wordsworth*, Belgian, for New York, N. Y.; steamship *Cordova*, French, for New Orleans, La.; November 19, steamship *Salerno*, German, for New York, N. Y.; bark *Baltimore*, American, for Baltimore, Md.

Respectfully, yours,

R. CLEARY, M. D.,
Sanitary Inspector, M. H. S.

RIO DE JANEIRO, *November 26, 1895.*

SIR: I have the honor to transmit the report for the week ended November 23, 1895.

There were 17 deaths from accesso pernicioso, an increase of 11; 18 from yellow fever, an increase of 11; 49 from smallpox, a decrease of 9; 3 from beriberi, none in the foregoing week; 2 from enteric fever, the same as in the foregoing week; 1 from whooping cough, the same as in the foregoing week; 60 from tuberculosis, an increase of 14; and none from measles. From all causes there were 364 deaths, an increase of 19.

Yellow fever.—This disease is slowly increasing with the warmer weather, though as yet there is nothing to be alarmed about.

Smallpox.—The continued decrease in the number of deaths from this cause is reason to hope that the disease is steadily declining so that we may hope that it will soon become extinct.

Since last report the following-named ships have been inspected and received bills of health from this office: November 21, steamship *Biela*, British, for New York, N. Y.; November 25, steamship *Asiatic Prince*, British, for New York from Santos.

Respectfully, yours,

R. CLEARY, M. D.,
Sanitary Inspector, M. H. S.

EGYPT.

Cholera in Egypt.

CAIRO, EGYPT, *November 27, 1895.*

SIR: Adverting to my cablegram of October 16 and my dispatch No. 128, dated October 21, I have to inform the Department that the number of deaths from cholera in Egypt at this date amounts to 730.

Immediately following my previous dispatch the death rate increased and averaged about 20 per day until a fortnight ago. Now it is from 6 to 8 a day, and there are indications that the malady has nearly run its course.

The epidemic has been confined to Damietta and the villages on or near Lake Menzaleh, the southernmost point from which cases have been reported being Mansourah.

Experienced physicians doubt if it can correctly be called Asiatic cholera; some claim it is but a form of the disease peculiar to the dietary conditions common to the district where decayed fish is the favorite food.

The widespread and almost universal dislike of official interference that pervades the agricultural population of the provinces and the lower class of natives in the towns has led to the concealment of a large number of cases. Many of the persons attacked have been carried into the fields to remain during the day and carried back to their homes by night. The medical inspection of the villages is consequently made to a great extent by night, in order to avoid passing over suspicious cases of illness. It is only by the most thorough and strict examination of the villages that cases are brought to light, and thus far 900 only have been officially reported.

One of the features of the outbreak is the abnormally large proportion of young children attacked, of whom few recover. It is said here there is a marked difference between the symptoms that attend this disease and those of Asiatic cholera as it is known in India. In most instances expert medical men state that the former is not accompanied by the same acute pains that are observable in the latter.

The cholera visitation of 1865 carried off 61,000 people, and that of 1883, 4,000 less than that number. In 1883 the cholera began at Damietta on June 22, reached Cairo on July 15, and traveled up the course of the Nile as far south as Esneh, where it arrived on September 10.

The present outbreak is not in any way affecting tourist travel to Egypt, and the Cairo and Nile season, now beginning, promises to attract an unprecedented number of visitors from Europe and America.

It is predicted by European medical officers employed by the khedivial government in the stricken district that December will see the end of the outbreak, but fears are expressed of the reappearance of cholera next summer.

I have the honor to be, sir, your most obedient servant,

FREDERIC C. PENFIELD,
Agent and Consul-General.

FRANCE.

Smallpox at Marseilles.

MARSEILLES, *November 29, 1895.*

SIR: I have the honor to confirm my telegram of the 21st instant as follows: "Smallpox epidemic at Marseilles."

As in the case of previous epidemics at this place, I am unable to give official figures as to the extent of the disease, either in number of cases or number of deaths. No official information is given and everything possible is done to conceal the facts concerning the matter. This is, perhaps, well enough in behalf of the commercial community, but the effort to maintain secrecy, with its attendant lack of sanitary precautions, has proven disastrous to the public health. There has been but one newspaper reference to the matter, and that in the Simaphore of the 8th instant, as follows:

"At Marseilles the death rate has sensibly increased during the month of October past. From the 1st to the 31st, inclusive, there were registered 924 deaths, of which 335 were children. This increase in the number of deaths must be attributed to the increase of eruptive fevers—measles, scarlatina, and smallpox. The total of deaths during the three months from smallpox was as follows: Twenty-nine in August, 67 in September, and 100 in October."

These figures, I presume, the newspaper secured from official sources. I have learned unofficially, but from physicians, that the disease has attacked every part of the city, and that the number of cases during the first twenty days of this month, if properly ascertained, would foot up a startling total. During the three months previous to November 1 there must have been in excess of 1,000 cases. For the present month there are no means of ascertaining the number, but yesterday afternoon there were 120 cases at one hospital and every bed in the smallpox wards was occupied. In view of these facts we are not issuing clean bills of health, and shippers of goods coming within the limits of the quarantine regulations of April 26, 1894, have been requested to hold their goods, if possible, until the epidemic declines and in case shipment is necessary that the quarantine regulations must be complied with.

I am, sir, your obedient servant,

CLAUDE M. THOMAS,
United States Consul.

Hon. ASSISTANT SECRETARY OF STATE.

GIBRALTAR.

Quarantine Notice.

NOTICE.

GIBRALTAR, *December 3, 1895.*

The board of health this day decided that arrivals from Rabat be subjected to fourteen days' quarantine, and that arrivals from ports within the radius of 165 kilometers, measured in a direct line from that place, be subjected to seven days' quarantine of observation, to be reckoned from date of their departure.

By order.

JOHN C. KING,
Secretary to the Board.

JAPAN.

Occurrence of Cholera in Japan.

The first recorded appearance of cholera in Japan was in 1822, when it seems to have been introduced from China. It broke out again in 1858–60, on which occasion it is claimed by the Japanese that it was imported by an American man-of-war into Nagasaki.

No statistics exist of these two epidemics, but they were widespread

and the mortality large. Since then cholera has been present in Japan as follows:

Year.	Cases.	Deaths.	Year.	Cases.	Deaths.
1877	13,816	8,027	1887	1,228	654
1878	902	274	1888	811	460
1879	162,639	105,786	1889	751	431
1880	1,580	618	1890	46,019	35,227
1881	9,389	6,237	1891	11,142	7,760
1882	51,631	33,784	1892	874	497
1883	969	434	1893	633	364
1884	900	414	1894	546	314
1885	13,772	9,310	1895 (to November 14)	56,367	39,721
1886	155,923	108,409			

Weekly Report of Cholera in Japan.

Places.	November 8 to November 14.		Places.	November 8 to November 14.	
	Cases.	Deaths.		Cases.	Deaths.
Hokkaido	0	1	Yamagata Ken	12	12
Tokyo Fu	26	60	Akita Ken	4	6
Kioto Fu	2	0	Fukui Ken	3	3
Osaka Fu	8	81	Ishikawa Ken	6	4
Kanagawa Ken	5	2	Toyama Ken	8	10
Hiogo Ken	0	0	Shimane Ken	0	0
Nagasaki Ken	0	0	Tottori Ken	0	0
Niigata Ken	57	65	Okayama Ken	9	7
Saitama Ken	0	0	Hiroshima Ken	0	3
Chiba Ken	6	6	Yamaguchi Ken	1	1
Ibaraki Ken	3	3	Wakayama Ken	2	2
Gumba Ken	0	0	Tokushima	0	0
Tochigi Ken	0	0	Kagawa Ken	0	0
Nara Ken	0	0	Yehime Ken	4	3
Miye Ken	4	9	Kochi Ken	16	16
Aichi Ken	5	4	Fukuoka Ken	2	2
Shidzuoka Ken	0	0	Oita Ken	7	4
Yamanashi Ken	0	0	Saga Ken	0	0
Shiga Ken	0	1	Kumamoto Ken	8	4
Gifu Ken	0	0	Miyasaki Ken	0	0
Nagano Ken	1	2	Kagoshima Ken	0	4
Miyagi Ken	2	5	Okinawa Ken	41	8
Fukushima Ken	6	7	Niijima Quarantine	0	0
Iwate Ken	0	0	Hikojima Quarantine	0	0
Awomori Ken	0	0	Sakurajima Quarantine	0	0
			Total	242	385

From outbreak to November 14, 56,367 cases, 39,721 deaths.

RUSSIA.

Cholera in St. Petersburg.

LEGATION OF THE UNITED STATES,
St. Petersburg, November 23, 1895.

SIR: You doubtless have learned from the public press, or from our consuls at Warsaw and Odessa, of the extensive prevalence of cholera for some time in the southwestern governments of Volhynia and Kiew, which lie between those cities. The number of deaths in those governments during the first half of October, Russian style, was 628, while the total number of cases there was 1,528. All of these cases except 38 were in Volhynia, and of the deaths all except 12 were in the same government. The disease, however, did not appear to extend much beyond the regions first affected, and no general alarm or inconvenience

seemed to be occasioned in other parts of the country by its prevalence there.

During the entire summer and fall there have been cases in this city similar to cholera; but the great care exercised by the authorities made them a matter of no anxiety to the general and traveling public. For the last few days, however, this illness has assumed a more pronounced type, and while not very extensive, it is yet given publicity as cholera.

I inclose statement showing the movement of the disease in St. Petersburg for the past two days. The first statement shows 30 old cases, 2 new cases, and 3 deaths for the day ending 12 m., the 21st instant, and the second shows 28 old cases, 7 new cases, and 2 deaths for the day ending 12 m., the 22d instant.

While the cholera germ does not yield to frost as readily as some others, and the next few weeks may be marked by the continuance of the disease, and possibly by its increase for a time, yet I see no material sign at present for alarm nor any real occasion for alarm, as there appears to be good ground for confidence in the efficiency of the authorities and in the effect of severe frost, which can not be much longer delayed. I have thought it proper, however, to lay the facts before you.

I have the honor to be, sir, your obedient servant,

CLIFTON R. BRECKINRIDGE,
United States Minister.

STATISTICAL REPORTS.

BAHAMAS—*Dunmore Town.*—Two weeks ended December 6, 1895. Estimated population, 1,472. No deaths.

Governor's Harbor.—Two weeks ended December 7, 1895. Estimated population, 1,195. No deaths.

Green Turtle Cay—Abaco.—Two weeks ended December 5, 1895. Estimated population, 3,900. No deaths.

BERMUDA.—Two weeks ended December 13, 1895. Estimated population, 15,013. Total deaths, 3. No deaths from contagious diseases.

CUBA—*Habana.*—Under dates of December 7 and 14, 1895, the United States sanitary inspector reports as follows:

There were 494 deaths in this city during the month of November, 1895. Thirty-six of those deaths were caused by yellow fever, 21 by enteric fever, 15 by so-called pernicious fever, 3 by paludal fever, 1 by bilious fever, 1 by diphtheria, 29 by enteritis, 10 by dysentery, 3 by smallpox, 14 by pneumonia, and 3 by glanders.

During the week ending December 5, 1895, there were 101 deaths, 8 of which were caused by yellow fever, with 18 new cases approximately; 5 were caused by enteric fever, 1 by so-called pernicious fever, 1 by paludal fever, 5 by enteritis, 1 by dysentery, and 2 by pneumonia. Five of the 8 deaths by yellow fever during the week occurred in the Military Hospital.

There were 124 deaths in this city during the week ending December 12, 1895. Six of those deaths were caused by yellow fever, with 12 new cases approximately; 2 were caused by enteric fever, 4 by so-called pernicious fever, 2 by paludal fever, 1 by diphtheria, 12 by enteritis, 2 by dysentery, 1 by smallpox, 8 by pneumonia, and 1 by glanders.

GREAT BRITAIN—*England and Wales.*—The deaths registered in 33 great towns of England and Wales during the week ended December 7

correspond to an annual rate of 17.9 a thousand of the aggregate population, which is estimated at 10,591,530. The lowest rate was recorded in Croydon, viz, 10 and the highest in Liverpool, viz, 28.9 a thousand.

London.—One thousand four hundred and fifty-nine deaths were registered during the week, including smallpox, 1; measles, 105; scarlet fever, 19; diphtheria, 69; whooping cough, 30; enteric fever, 16; diarrhea and dysentery, 9. The deaths from all causes corresponded to an annual rate of 17.3 a thousand. In greater London 1,837 deaths were registered, corresponding to an annual rate of 15.8 a thousand of the population. In the "outer ring" the deaths included 13 from diphtheria, 8 from measles, and 9 from whooping-cough.

Ireland.—The average annual death rate represented by the deaths registered during the week ended December 7 in the 16 principal town districts of Ireland was 21.4 a thousand of the population. The lowest rate was recorded in Drogheda, viz, 4.4, and the highest in Kilkenny, viz, 51.9 a thousand. In Dublin and suburbs 135 deaths were registered, including enteric fever, 1; smallpox, 1; and whooping cough, 12.

Scotland.—The deaths registered in 8 principal towns during the week ended December 7 corresponded to an annual rate of 19.5 a thousand of the population, which is estimated at 1,500,435. The lowest mortality was recorded in Leith, viz, 14.2, and the highest in Dundee, viz, 24.4 a thousand. The aggregate number of deaths registered from all causes was 562, including measles, 6; scarlet fever, 8; diphtheria, 10; and whooping cough, 19.

SPAIN—*Corunna.*—Month of October, 1895. Estimated population, 32,113. Total deaths, 101, including smallpox, 3; typhus fever, 1; enteric fever, 3; and measles, 1.

Month of November, 1895. Total deaths, 115, including smallpox, 5; typhus fever, 2; enteric fever, 26; and measles, 2.

MORTALITY TABLE, FOREIGN CITIES.

Cities.	Week ended.	Estimated population.	Total deaths from all causes.	Deaths from—								
				Cholera.	Yellow fever.	Smallpox.	Typhus fever.	Enteric fever.	Scarlet fever.	Diphtheria.	Measles.	Whooping cough.
Aix la Chapelle	Nov. 30	110,966	37	.....	.....	.....	.....	.....	.....	2	1	.....
Alexandria	Nov. 18	231,396	144	.....	.....	1	.....	.....	.....	2	.....	1
Amherstburg	Dec. 14	2,300	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Amsterdam	Dec. 7	455,013	150	.....	.....	.....	.....	.....	1	3	.....	1
Batoum	Nov. 26	28,000	4	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belfast	Dec. 7	273,277	127	.....	.....	.....	.....	5	3	.....	3	2
Berlin	Nov. 23	1,674,115	530	.....	.....	.....	.....	2	19	24	7	.....
Birmingham	Dec. 7	496,751	171	.....	.....	.....	.....	1	7	4	11	2
Bombay	Nov. 19	853,926	454	9	.....	.....	.....	.....	.....	.....	.....	.....
Bordeaux	Sept. 8	252,415	117	.....	.....	.....	.....	2	.....	1	.....	.....
Do	Sept. 15	252,415	115	.....	.....	.....	.....	2	.....	.....	.....	1
Do	Sept. 22	252,415	104	.....	.....	.....	.....	1	.....	.....	.....	.....
Do	Sept. 29	252,415	123	.....	.....	.....	.....	2	.....	.....	.....	.....
Do	Oct. 6	252,415	111	.....	.....	.....	.....	2	.....	.....	.....	.....
Do	Oct. 13	252,415	89	.....	.....	.....	.....	1	.....	.....	.....	.....
Do	Oct. 20	252,415	112	.....	.....	.....	.....	4	.....	.....	.....	.....
Do	Oct. 27	252,415	107	.....	.....	.....	.....	2	.....	1	.....	2
Do	Nov. 3	252,415	112	.....	.....	.....	.....	3	.....	.....	.....	.....
Do	Nov. 10	252,415	107	.....	.....	.....	.....	3	.....	.....	.....	1
Do	Nov. 17	252,415	93	.....	.....	.....	.....	4	.....	.....	.....	.....
Do	Nov. 24	252,415	96	.....	.....	.....	.....	2	.....	.....	.....	.....
Do	Dec. 3	252,415	107	.....	.....	.....	.....	2	.....	.....	.....	.....
Bremen	Dec. 30	128,000	45	.....	.....	.....	.....	.....	.....	1	.....	.....
Bristol	Nov. 23	228,139	63	.....	.....	.....	.....	.....	.....	3	.....	.....
Brunswick	Dec. 7	101,047	.....	.....	.....	.....	.....	.....	7	3	.....	.....
Brussels	Nov. 30	507,985	161	.....	...	.....	.....	2	.....	4	1	1
Budapest	Dec. 2	600,000	.....	.....	.....	.....	.....	2	4	3	6	.....
Cairo	Nov. 18	374,838	323	.....	.....	.....	.....	3	.....	3	.....	.....
Calcutta	Nov. 9	681,560	521	47	.....	.....	.....	.....	.....	.....	.....	2
Callao	Nov. 17	25,000	23	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Nov. 24	25,000	22	.....	.....	.....	.....	.....	.....	.....	.....	.....
Catania	Dec. 3	120,000	56	.....	.....	.....	3	1	1	2	.....	.....
Chatham	Dec. 14	9,052	6	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chemnitz	Nov. 30	156,800	86	.....	.....	.....	.....	.....	.....	2	.....	.....
Coaticook	Dec. 14	2,500	0	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cognac	Nov. 30	17,500	6	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Dec. 7	17,500	5	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cologne	do	317,543	92	.....	.....	.....	.....	.....	.....	1	.....	.....
Colombo	Nov. 9	130,000	81	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Nov. 16	130,000	80	.....	.....	.....	.....	.....	.....	.....	.....	.....
Copenhagen	Nov. 23	333,714	101	.....	.....	.....	.....	.....	1	.....	.....	4
Dublin	Dec. 7	350,000	135	.....	.....	1	.....	1	.....	.....	.....	.....
Dundee	do	160,163	74	.....	.....	.....	.....	.....	1	1	2	.....
Edinburg	Dec. 6	273,535	92	.....	.....	.....	.....	2	4	1	.....	.....
Flushing	Dec. 7	16,200	10	.....	.....	.....	.....	.....	.....	.....	.....	.....
Frankfort on the Main	do	228,750	79	.....	.....	.....	.....	1	2	1	*1	2
Funchal	Nov. 23	35,665	21	.....	.....	.....	.....	.....	.....	1	.....	.....
Do	Nov. 30	35,665	22	.....	.....	.....	2	.....	.....	4	.....	.....
Gibraltar	Dec. 1	25,800	6	.....	.....	.....	.....	.....	.....	.....	.....	.....
Girgenti	Nov. 30	24,428	11	.....	.....	.....	.....	.....	.....	2	.....	.....
Glasgow	Dec. 7	695,876	257	.....	.....	.....	.....	1	2	6	1	12
Gothenburg	Nov. 23	108,801	35	.....	.....	.....	.....	.....	3	.....	.....	.....
Do	Nov. 30	108,801	34	.....	.....	.....	.....	.....	3	.....	.....	1
Halifax	Dec. 14	38,700	13	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hamburg	Dec. 7	608,710	214	.....	.....	.....	.....	2	2	1	.....	4
Hongkong	Nov. 9	232,662	(*)	.....	.....	.....	.....	.....	.....	.....	.....	.....
Honolulu	Nov. 23	28,000	16	.....	.....	.....	.....	.....	.....	.....	.....	3
Do	Nov. 30	28,000	12	.....	.....	.....	.....	1	.....	.....	.....	1
Kehl, Strasburg	Nov. 16	129,556	51	.....	.....	.....	.....	.....	.....	3	.....	1
Do	Nov. 23	129,556	53	.....	.....	.....	.....	1	.....	5	.....	2
Kingston, Canada	Dec. 20	17,955	19	.....	.....	.....	.....	.....	.....	.....	.....	.....
Konigsberg	Dec. 7	169,200	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Leeds	do	395,546	138	.....	.....	.....	.....	3	2	.....	3	7
Leghorn	do	103,434	42	.....	.....	.....	.....	.....	.....	2	.....	.....
Leith	Nov. 30	73,048	16	.....	.....	.....	.....	.....	.....	.....	.....	.....
Liege	Dec. 7	160,848	58	.....	.....	.....	.....	2	3	.....	.....	.....
Liverpool	do	638,291	315	.....	.....	.....	1	6	3	3	20	10
London, Canada	Dec. 14	35,000	6	.....	.....	.....	.....	.....	.....	.....	.....	.....
London, England	Nov. 23	6,048,555	1,900	.....	.....	1	.....	23	29	84	113	26
Do	Nov. 30	6,048,555	1,850	.....	.....	3	.....	26	21	73	107	25
Do	Dec. 7	6,048,555	1,837	.....	.....	3	.....	27	20	82	113	30
Lyons	Nov. 23	500,000	152	.....	.....	.....	.....	.....	.....	2	.....	.....
Do	Nov. 30	500,000	193	.....	.....	.....	.....	.....	.....	1	.....	1

* One death from plague.

MORTALITY TABLE, FOREIGN CITIES—Continued.

Cities.	Week ended.	Estimated population.	Total deaths from all causes.	Deaths from—								
				Cholera.	Yellow fever.	Smallpox.	Typhus fever.	Enteric fever.	Scarlet fever.	Diphtheria.	Measles.	Whooping cough.
Madras	Nov. 15	452,518	319	.....	.....	.....	.....	.....	.....	.....	2	.....
Madrid	Nov. 26	482,816	257	.....	.....	9	9	.....	.....	2	1	.....
Do	Dec. 3	482,816	276	.....	.....	3	.....	5	.....	1	.....	.....
Magdeburg	Nov. 9	224,746	77	.....	.....	.....	.....	.....	2	4	.....	2
Do	Nov. 16	224,746	62	.....	.....	.....	.....	.....	.....	5	.....	3
Manchester	Dec. 7	527,010	235	.....	.....	.....	.....	4	8	4	21	5
Manila	Nov. 5	400,000	160	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mannheim	Nov. 30	88,400	24	.....	.....	.....	.....	.....	.....	3	.....	.....
Maracaibo	do	42,000	19	.....	.....	.....	.....	.....	.....	.....	.....	.....
Matamoras	Dec. 13	8,000	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Messina	Dec. 7	107,000	26	.....	.....	.....	.....	1	2	1	.....	.....
Monte Cristy	do	1,500	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morocco	Nov. 30	35,000	6	.....	.....	.....	.....	.....	.....	.....	.....	.....
Moscow	Nov. 23	800,000	403	.....	.....	.....	9	.....	12	8	4	1
Do	Nov. 30	800,000	410	.....	.....	.....	6	.....	8	15	1	.....
Munich	do	396,000	181	.....	.....	.....	.....	.....	2	4	7	1
Do	Dec. 7	396,000	188	.....	.....	.....	.....	1	2	8	3	.....
Naples	do	510,000	210	.....	.....	6	.....	12	.....	.....	.....	.....
Newcastle on Tyne	do	201,021	56	.....	.....	.....	.....	1	.....	.....	1	3
Nogales	Nov. 23	166,386	50	.....	.....	.....	.....	.....	1	3	.....	2
Nuremberg	Nov. 30	343,500	130	.....	.....	2	.....	4	2	1	4	1
Osaka and Hiogo	Nov. 16	158,693	68	.....	.....	.....	.....	2	.....	1	.....	.....
Palermo	Nov. 30	273,000	115	.....	.....	.....	1	.....	6	6	.....	.....
Paris	do	2,424,705	840	.....	.....	.....	.....	8	2	13	12	3
Do	Dec. 7	2,424,705	866	.....	.....	.....	.....	1	4	7	20	3
Pernambuco	Nov. 9	200,000	120	.....	2	14	.....	1	.....	.....	.....	.....
Do	Nov. 16	200,000	120	.....	2	14	.....	.....	.....	.....	.....	.....
Plymouth	Dec. 7	86,781	26	.....	.....	.....	.....	1	.....	.....	.....	.....
Prague	Nov. 30	196,377	102	.....	.....	.....	.....	3	.....	1	.....	.....
Puerto Cortez	Dec. 10	1,500	0	.....	.....	.....	.....	.....	.....	.....	.....	.....
Queenstown	Nov. 30	13,000	5	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rheims	do	105,408	32	.....	.....	.....	.....	2	.....	3	1	.....
Do	Dec. 7	105,408	35	.....	.....	.....	.....	1	.....	1	.....	.....
Rio de Janeiro	Nov. 16	600,000	345	.....	7	58	.....	2	.....	.....	2	1
Do	Nov. 23	600,000	364	.....	18	49	.....	2	.....	.....	.....	1
Rotterdam	Dec. 7	272,042	101	.....	.....	1	.....	.....	.....	.....	.....	.....
St. Petersburg	Nov. 30	954,400	542	15	.....	4	.....	26	13	13	14	11
St. Stephens	Dec. 14	3,000	1	.....	.....	.....	.....	1	.....	.....	.....	.....
St. Thomas	Nov. 22	12,019	9	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Nov. 29	12,019	5	.....	.....	.....	.....	.....	.....	.....	.....	.....
Santiago de Cuba	Dec. 7	60,000	53	.....	20	.....	.....	.....	1	1	.....	.....
Schiedam	do	25,953	9	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sheffield	do	345,904	106	.....	.....	.....	.....	3	.....	1	3	.....
Sonneberg	Nov. 24	12,000	4	.....	.....	.....	.....	.....	.....	.....	.....	.....
Southampton	Nov. 16	88,000	32	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Shields	Dec. 7	89,904	23	.....	.....	.....	.....	1	.....	.....	.....	.....
Stettin	Nov. 30	135,000	59	.....	.....	.....	.....	1	2	1	.....	.....
Stockholm	do	259,304	64	.....	.....	.....	.....	.....	2	2	.....	.....
Stuttgart	Dec. 5	153,811	47	.....	.....	.....	.....	.....	1	1	.....	.....
Sunderland	Dec. 7	137,705	36	.....	.....	.....	.....	1	.....	.....	.....	1
Tegucigalpa	Nov. 23	12,000	4	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Nov. 30	12,000	5	.....	.....	.....	.....	.....	.....	.....	.....	.....
Trapani	do	43,095	10	.....	.....	.....	.....	.....	.....	.....	1	.....
Trieste	do	158,314	94	.....	.....	.....	.....	.....	.....	9	.....	.....
Truxillo	do	4,000	0	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	Dec. 7	4,000	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tuxpan	do	10,280	4	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vera Cruz	Dec. 12	25,500	20	.....	.....	.....	.....	.....	.....	.....	.....	.....
Warsaw	Nov. 23	535,968	198	.....	.....	.....	3	.....	8	8	8	1
Do	Nov. 30	535,968	194	.....	.....	.....	4	1	14	.....	4	1
Winnipeg	Dec. 9	37,062	3	.....	.....	.....	.....	.....	.....	.....	.....	.....
Zurich	Nov. 30	138,000	45	.....	.....	.....	.....	.....	.....	2	.....	.....

By authority of the Secretary of the Treasury:

WALTER WYMAN,

Supervising Surgeon-General Marine-Hospital Service.

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